



**2007 U.S. Coast Guard Innovation Expo  
“U.S. Coast Guard Innovation: Improving Mission Execution and Sustainment”**

New Orleans, LA

29 October – 1 November 2007

Agenda

**Monday, October 29, 2007**

**“Operationalizing MDA”**

**MDA Day Welcoming Remarks:**

**VADM Robert Papp**, USCG, Coast Guard Chief of Staff

“National Concept of Operations for Maritime Domain Awareness”, **Mr. Dana Goward**, Director, Coast Guard MDA Program Integration (CG-51-M)

**Interagency Staff Leads**

- **RDML Lee Metcalf**, USN, Director, Global Maritime Situational Awareness (GMSA)

“U.S. Coast Guard MDA Projects”, **RDML Rob Parker**, USCG, Assistant Commandant for Capabilities (CG-7)

**Afternoon Session – AIS Data Sharing**

“AIS 101 & Nationwide AIS Project”, **CDR Keith Ingalsbe**, USCG, Project Manager, Coast Guard Nationwide AIS Project

**AIS Collection with Satellites**

- “Government Satellites – TACSAT”, **Mr. Christopher Huffine**, Naval Research Lab

**Sharing AIS Data**

- “Maritime Security and Safety Information System (MSSIS)”, **CDR Ric Callesen**, USN COMNAVEUR
- “Maritime Administration Efforts”, **Mr. Owen Doherty**, MARAD
- “MDA Data Sharing Community of Interest”, **Mr. Jay Spalding**, USCG R&D Center

Program Executive Office Command, Control, Communications, Computers and Intelligence (PEO C4I), **Mr. Andy Farrar**, U.S. Navy PEO C4I

**Tuesday, 30 October 2007**

**Expo Keynote Session #1**

The Honorable **David Walker**, Comptroller General, U.S. Government Accountability Office(GAO)

**Expo Panel Session: Innovations in Government**

Moderated by **Mr. Rolf Dietrich**, Deputy Director of Innovation, DHS S&T

**Panelists:**

- **Ms. Elizabeth Durham-Ruiz**, Chief of the Partnership, Group, STRATCOM
- **CAPT David Newton**, USCG, Director (acting), Borders & Maritime Security Division, DHS S&T
- **Mr. Greg Price**, Special Assistant, Rapid Technology Insertion, DHS S&T
- **Mr. Kevin Lawson**, Chief, Applications Development Branch, IT Division, TSA

**Expo Keynote Session #2**

The Honorable **Jay Cohen**, Under Secretary for Science and Technology, Department of Homeland Security

- Navy Littoral Vehicle .wma video file
- Levee Sound Scenario 1 .wma video file
- Levee Sound Scenario 2 .wma video file
- First Shots .mpg video file
- Hersey Bypass .wma video file

**Expo Panel Session: *Innovation that Works - Turning Ideas into Opportunities***

Moderated by: **Dr. Neil Thornberry**, Innovation Chair Naval Postgraduate School (NPS)

**Wednesday, October 31, 2007**

**Expo Panel Session: *Biometrics-at-Sea; Mona Passage Proof of Concept***

Moderated by: CDR Eric Riepe, USCG, Office of CG Law Enforcement

**Panelists:**

- **CDR Rick Christoffersen**, USCG, Response Department Head, CG Group Humboldt Bay
- **LCDR M. Andre Billeaudeaux**, USCG, Director, CG Auxiliary, 13th CG District
- **LCDR Christopher Kluckhuhn**, USCG, Organizational Performance Consultant, 1st CG District ASTC
- **Mario Vittone**, USCG, Instructor, CG Rescue Swimmer School, CG Aviation Technical Training Center

**Expo Keynote Session #3**

“SecondLife”, **Mr. John Lester**, (ppt format) “Pathfinder Linden”, Linden Labs

**Acquisition Insights Panel Session: *USCG Acquisition Directorate (CG-9)***

Moderated by: RADM Gary Blore, USCG, Assistant Commandant for Acquisition

**Photo Slide Show**



# Acquisition Directorate

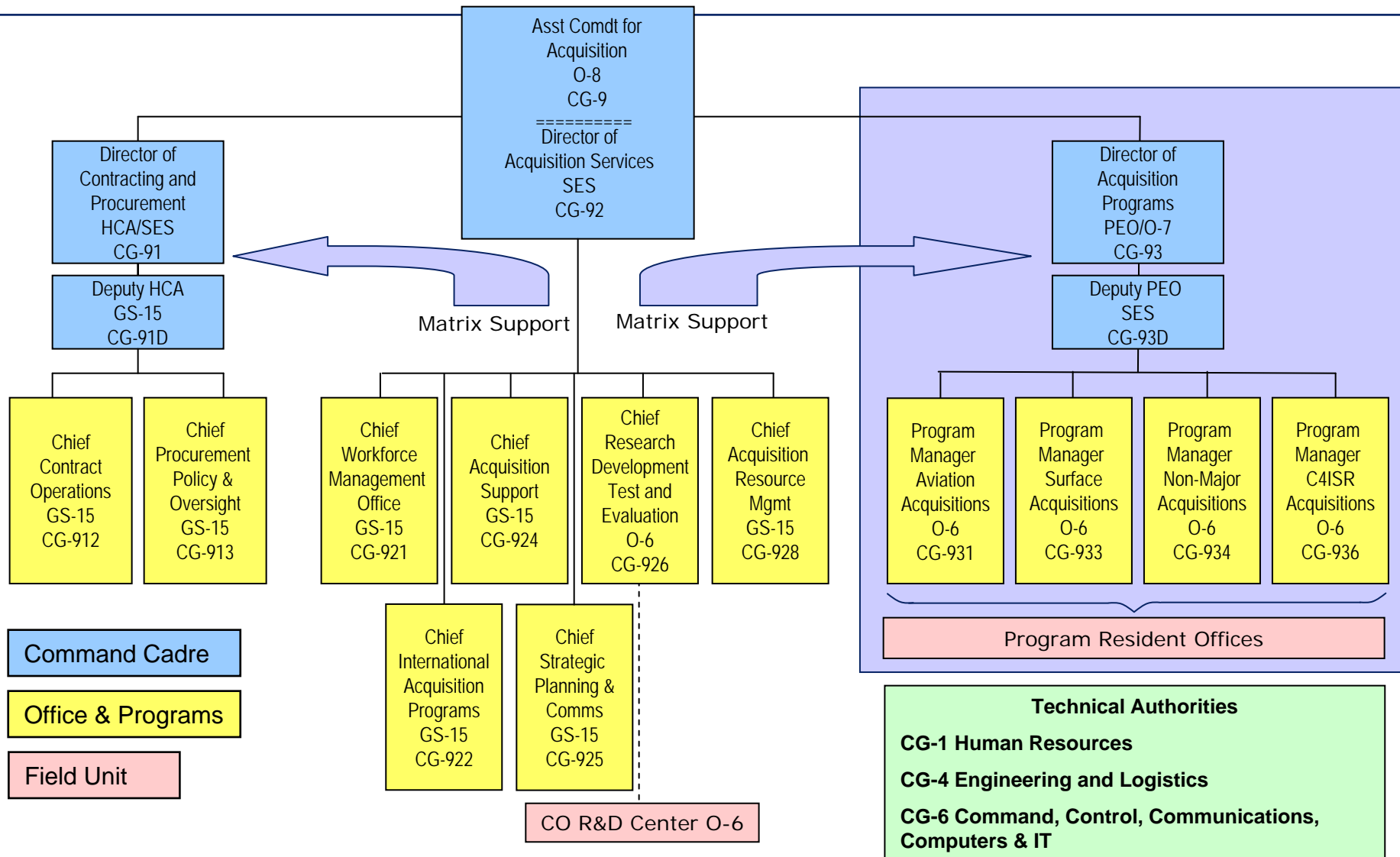
## Acquisition Insights & Transformation

CG-9 | RADM Gary T. Blore

31 October, 2007



# CG-9 Full Operational Capability, FY09







# Acquisition Directorate



# Director of Acquisition Programs (CG-93) – Acquisition Program Update

## Surface

- National Security Cutter
- Offshore Patrol Cutter
- Fast Response Cutter
- Coastal Patrol Boat
- Mission Effectiveness Project
- Response Boat Medium
- Ramping Down: Response Boat Small
- Long Range Interceptor / Short Range Prosecutor
- Close Out: Great Lakes Ice Breaker Replacement
- On the Horizon: Inland River Tender Emergency Sustainment

## Aviation

- Long Range Surveillance HC-130H & HC-130J
- Medium Range Surveillance HC-144A
- Multi-mission Cutter Helicopter HH/MH-65C
- Medium Range Recovery Helicopter HH/MH-60J/T
- Unmanned Air Systems
- MH-68A/HITRON

## C4ISR

- Deepwater C4ISR
- Rescue 21
- Nationwide Automatic Identification System
- On the Horizon: Command 21

## Logistics

- Logistics Integrated Management System

# Surface Projects



Length 418 Ft  
Speed 28 kts  
Range 12,000 nm  
Endurance 60 Days

## National Security Cutter (NSC) : (8)

- Hull #1 BERTHOLF 88% complete
- Hull #2 WAESCHE 32% complete
- Hull #3 on contract (Aug 07)



Length 360 Ft\*  
Speed 25 kts\*  
Range 9,000 nm\*  
Endurance 45 Days\*

## Offshore Patrol Cutter (OPC): (25)

- Production to begin 2012
- NSC, LCS lessons learned
- ABS Classed

\* Preliminary Characteristics



Length 140 - 160 Ft  
Speed 30 kts\*  
Range 4,230 nm\*  
Endurance 7 Days\*

## Fast Response Cutter (FRC): (58)

- Competitive FRC-B RFP released June 07
- Parent craft
- ABS Classed

\* Preliminary Characteristics



Length 44 Ft  
Speed 42 kts  
Range 250 nm

## Response Boat - Medium (RB-M): (180)

- Twelve under contract
- First to be delivered March 08



Length 87Ft  
Speed 25 kts  
Range 600 nm

## Coastal Patrol Boat (CPB): (73)

- There are currently 8 remaining CPB's on contract
- Final CPB to be delivered Feb 09



## Mission Effectiveness Project: (CG Yard)

- 1 - 110' complete, 4 on going, 18 remaining
- 2 - 210's complete, 2 on going, 10 remaining
- 4 - 270's availabilities complete,
- Purpose: System Recapitalization

# National Security Cutter (NSC)



- **Plan: 8 *Legend*-class cutters**
- **Current Status:**
  - **Hull 1 – BERTHOLF 88 Percent complete**
  - **Hull 2 – WAESCHE 32 Percent complete**
  - **Hull 3 – Production contract awarded to ICGS**

## **Upcoming:**

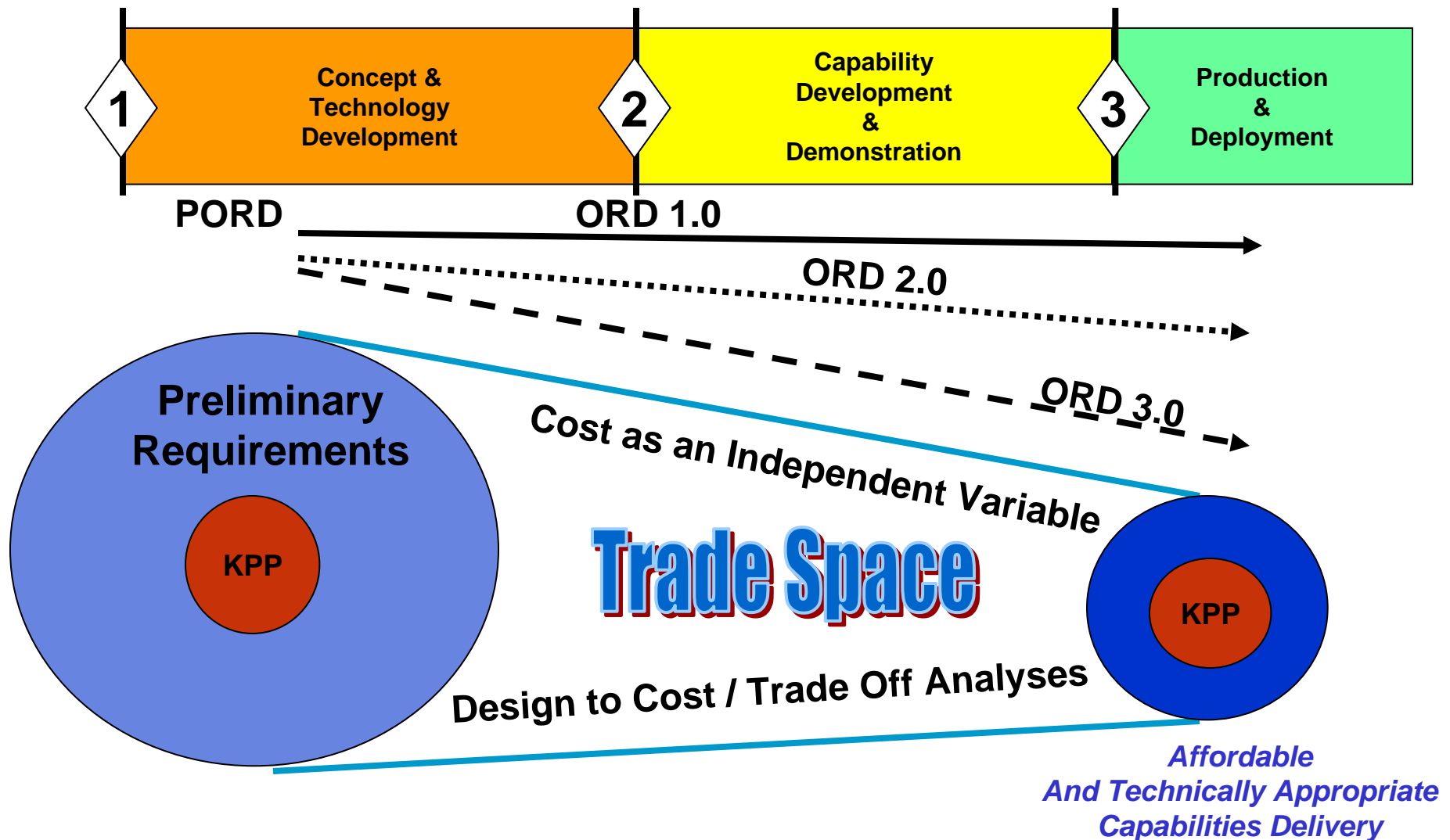
- **Builders trials, machinery trials and acceptance trials**

# Offshore Patrol Cutter (OPC)



- **Plan: 25 OPCs**
- **Notional Characteristics: length 360 ft; speed 25 kts; range 9,000 nm; endurance 45 days**
- **Current Status:**
  - **Requirements analysis and conceptual design phase**

# MSAM Acquisition Process





# Fast Response Cutter (FRC)



- **Plan: 58 FRCs (FRC-B first contract 12-34 hulls)**
- **Notional Characteristics: length 140-160 ft; speed 30 kts; range 4,230 nm; endurance 7 days**
- **Current Status:**
  - **Industry proposals due 1Q FY2008**

# Mission Effectiveness Project (MEP)

- 110'
  - 1 complete
  - 4 ongoing
  - 18 remaining
- 210'
  - 2 complete
  - 2 ongoing
  - 10 remaining
- 270'
  - 4 complete
  - 1 ongoing
  - 21 remaining (of 13 hulls total, each undergoes two availabilities)





# Response Boat – Medium (RB-M)



- **Plan: 180 RB-M**
- **Current Status:**
  - **12 boats under contract**
  - **First delivery, March 2008**
  - **Additional deliveries follow every 1-2 months**

# Long Range Interceptor & Short Range Prosecutor

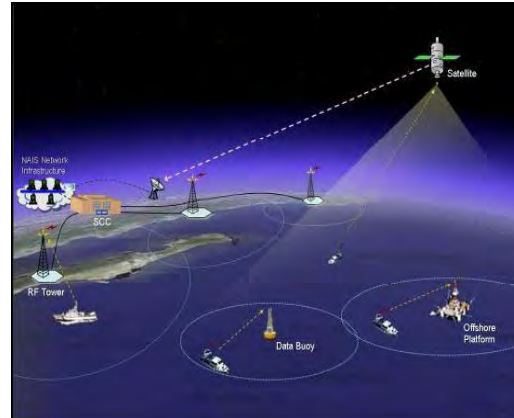


- **Plan: 33 LRI; 91 SRP**
- **Current Status:**
  - **LRI Factory Acceptance Testing complete**
  - **8 SRP delivered for the 123' WPB project**
  - **SRP 9+ will be acquired through competitive contract**

# Command, Control, Communications, Computers, Intelligence, Surveillance & Reconnaissance (C4ISR) Projects



**Deepwater  
C4ISR**



**Nationwide  
Automatic  
Identification  
System**



**Rescue 21:  
National  
Distress and  
Response  
System**

**On the horizon: Command 21**

# Deepwater C4ISR

- **Overview:**

- **Legacy Upgrades phases I and II complete on all cutters**
- **NSC Information Assurance (IA) testing begun**
- **HC-144A mission pallet installation & testing underway**
- **C-130J Missionization**
- **Command Center prototype installation at Miami and San Juan, Puerto Rico**



**HC-144A Mission System Pallet**

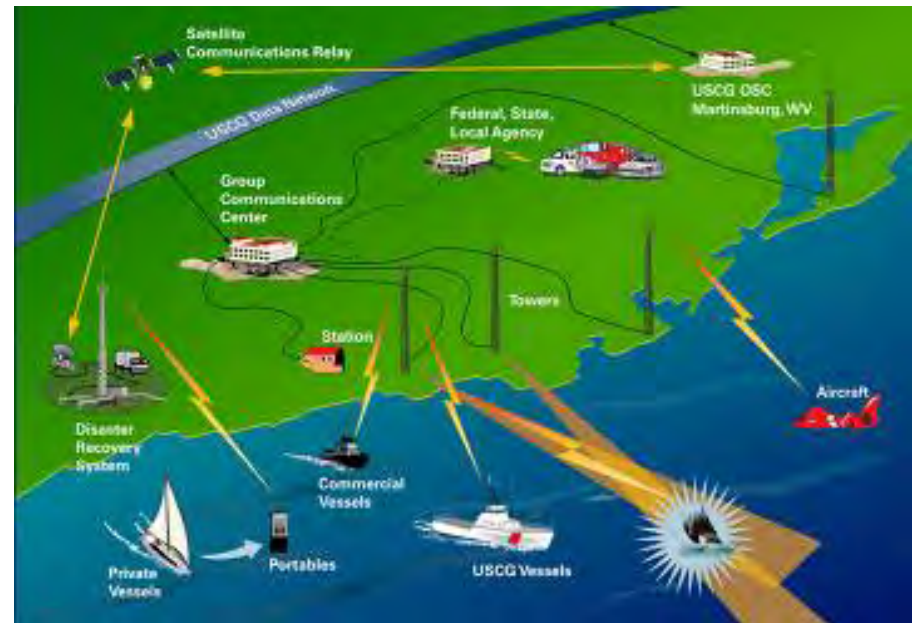


**Shore Facility Upgrades**



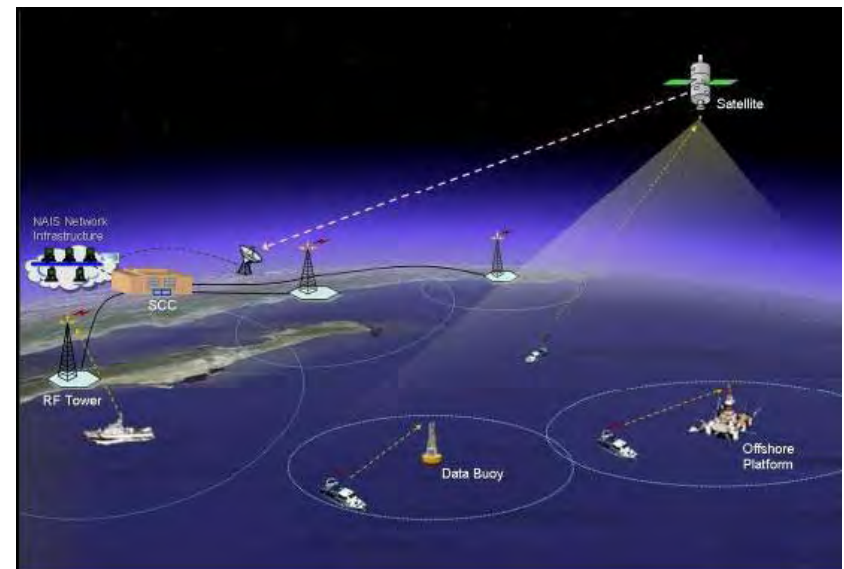
# Rescue 21

- Overview:
  - 39 Coast Guard Sectors to be outfitted with Rescue 21 capability
  - 6 Sectors delivered to date
  - 4 sectors began relying completely on new system in spring 2007



# Nationwide Automatic Identification System (NAIS)

- Overview:
  - 165 AIS sites provide receive coverage in 55 designated critical ports and 9 coastal areas
  - Increment 1 completed by end of CY2007
  - Increment 2 provides additional transmit and receive capability



# Integrated Logistics Systems (ILS)



- **Overview:**

- **USCG transitioning from commercial (Contractor Logistics Support) to organic (Government) logistics foundation**
- **USCG leads lifecycle logistics functions**
- **Logistics Information Management System (LIMS) in development for service-wide application**

# Aviation Projects Summary



Speed 175 kts  
Range 400 nm  
Endurance 4 hrs

## HH-65C: (95)

- 95 re-engined HH-65 helicopters delivered. 40% more power
- All air stations flying HH-65C's
- First AUF delivered to ATC Mobile



Speed 170 kts  
Range 600 nm  
Endurance 6 hrs

## HH-60J: (42)

- Conversion to upgrade avionics and extend service life
- First Conversion to MH-60T undergoing tests at AR&SC



Speed 170 kts  
Range 420 nm  
Endurance 4 hrs

## Helicopter Interdiction Tactical Squadron Ten (HITRON) (8)

- MH-68 Stingrays under contract
- Expires Jan 08



Speed 236 kts  
Range 1,565 nm  
Endurance 8.7 hrs

## Maritime Patrol Aircraft: (36)

- Aircraft #1, #2 & #3 at AR&SC
- #4-#8 on contract
- MSP – 3 on contract



Speed 330 kts  
Range 5,500 nm  
Endurance 21 hrs

## Long Range Search Aircraft HC-130J: (6)

- HC-130J aircraft will be missionized in Greenville, NC by Lockheed Martin Aero

## HC-130H initiative: (16)

- APS-137 radar replacement, avionics upgrade. 16 total HC-130H retained for DW
- Remaining aircraft to be retired



Speed 185 kts  
Range 100 nm  
Endurance 3 hrs

## Deepwater's Eagle Eye: (45)

- VUAV zeroed funding
- Stop work issued
- PEO charted 3 phase study
  - Evaluation of Eagle Eye & Fire Scout
  - Interim alternatives, manned and unmanned
  - Analysis of Phase II alternatives





# HC-130J/Long Range Surveillance Aircraft

- **\$120M Design to Cost , Task Order signed September 2005.**
  - **6 aircraft**
  - **Mission System design based on Medium Range Surveillance HC-144A**
  - **Belly mount radar, EO/IR, Flight Deck Mission System, Observer Stations**
- **First aircraft complete: Feb 2008**
- **Program complete: Sep 2008**



# HC-144A/Medium Range Surveillance Aircraft

- **Replacement for the HU-25 Falcon Maritime Patrol Aircraft**
  - Aircraft 1 accepted Dec 2006
  - Aircraft 2 accepted Feb 2007
  - Aircraft 3 accepted Apr 2007
  - Mission Systems Pallet (MSP) 1-3 Acceptance Testing ongoing
  - Aircraft 4 thru 8 under contract as of 21 July 2007



Mission Systems Pallet

# HC-144A/Medium Range Surveillance Aircraft



# M/HH-65C/Multi-mission Cutter Helicopter

- **Phase I - Complete**
  - **95 re-engined HH-65 helicopters delivered**
- **Phase II - Begun**
  - **Obsolete component modernization and Aircraft Ship Integrated Secure and Traversing System (ASIST)**
  - **Airborne Use of Force (AUF)**
- **Phase III – Begun**
  - **AFCS, cockpit upgrade and IDS C4ISR capabilities**



# H-60/Medium Range Recovery Helicopter

- **Service Life Extension Program**
  - Radar/FLIR Replacement
  - Engine Sustainment
  - Avionics Upgrades
- **First conversion to MH-60T undergoing tests at AR&SC**





# Unmanned Aircraft Systems (UAS)

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- **R&D Center is conducting UAS analysis studies**
- **UAS programs are being re-evaluated to available technology appropriate to USCG missions**
- **Possible joint UAS effort with other DHS agencies**



# Acquisition Directorate

*Thank You*

[www.uscg.mil/acquisition](http://www.uscg.mil/acquisition)



# 2007 U.S. COAST GUARD INNOVATION EXPO

U.S. COAST GUARD INNOVATION:  
IMPROVING MISSION EXECUTION AND SUSTAINMENT

*Back this year!*

2007 Maritime Domain Awareness Day

(aka "MDA Day")

Event #823A

Monday, October 29, 2007

(a 1-day forum)

<http://www.ndia.org/meetings/823A>



**OCT. 29 - NOV. 1, 2007**

<http://www.ndia.org/meetings/8230>

ERNEST N. MORIAL CONVENTION CENTER ► NEW ORLEANS, LA ► Event #8230



# USCG Innovation Expo Updated Agenda

(USCG Expo conference registration badge required in order to attend -  
There is an additional cost for those who registered for the 1-day MDA Forum only -  
MDA Day only badge no longer valid)

## Sunday, October 28, 2007

8:00 a.m. - 7:00 p.m.	Decorator set-up & Exhibitor Registration & set-up Exhibit Hall E foyer; 1st level Ernest N. Morial Convention Center
Monday, October 29, 2007	
8:00 a.m. - 12:00 p.m.	Decorator set-up & Exhibitor set-up (continues) Exhibit Hall E foyer; 1st level Ernest N. Morial Convention Center
8:00 a.m. - 7:30 p.m.	Exhibitor Registration (continues) Exhibit Hall E foyer Ernest N. Morial Convention Center
7:00 a.m. - 7:30 p.m.	“MDA Day” & USCG Innovation Expo Attendee Registration Check-in La Nouvelle Orleans Ballroom Foyer; 2nd level Ernest N. Morial Convention Center
7:00 a.m. – 8:00 a.m.	MDA Forum Attendees Continental Breakfast La Nouvelle Orleans Ballroom Foyer
3:00 p.m. - 7:30 p.m.	Expo Floor Opens Exhibit Hall E; 1st level
6:00 p.m. - 7:30 p.m.	NDIA Welcome Reception - Expo Floor

## Tuesday, October 30, 2007

7:00 a.m. - 5:30 p.m.	USCG Innovation Expo Attendee Registration Check-in (continues) La Nouvelle Orleans Ballroom Foyer; 2nd level Ernest N. Morial Convention Center
7:00 a.m. - 8:00 a.m.	Continental Breakfast La Nouvelle Orleans Ballroom Foyer
8:00 a.m. - 5:00 p.m.	Exhibitor Registration (continues) Exhibit Hall E foyer; 1st level Ernest N. Morial Convention Center
8:00 a.m. - 5:00 p.m.	Expo Floor Opens Exhibit Hall E; 1st level

8:00 a.m. – 9:00 a.m.


## Tuesday, October 30, 2007 (continued)

8:00 a.m. – 9:00 a.m.	USCG Expo Opening Session La Nouvelle Orleans Ballroom
	USCG Welcome & Opening Comments CAPT Joe Re, USCG Chairman, USCG Innovation Council
	NDIA Welcome & Opening Comments Lt Gen Lawrence P. Farrell, Jr., USAF (Ret.) President & CEO NDIA
	New Orleans Welcome Mayor C. Ray Nagin
	Louisiana Welcome The Honorable Kathleen Babineaux Blanco <i>(Invited)</i> Governor
	USCG Opening Remarks VADM Robert Papp, USCG Chief of Staff United States Coast Guard
	USCG Commandant Opening Remarks ADM Thad Allen, USCG Commandant United States Coast Guard
8:00 a.m. - 5:00 p.m.	Floor Open Exhibit Hall E; 1st level
9:00 a.m. - 10:00 a.m.	Expo Keynote Session #1 La Nouvelle Orleans Ballroom
	The Honorable David Walker Comptroller General, U.S. Government Accountability Office (GAO)
10:00 a.m. - 10:30 a.m.	Coffee Break in Exhibit Hall
10:30 a.m. - 11:30 a.m.	Expo Panel Session La Nouvelle Orleans Ballroom Innovations in Government Moderated by Mr. Rolf Dietrich, Deputy Director of Innovation, DHS S&T Directorate
	Panelists: TBA

# USCG Innovation Expo Updated Agenda (continued)

All session times, topics, and speakers subject to change

## Tuesday, October 30, 2007 (continued)

11:30 a.m. - 1:00 p.m.	Buffet Lunch Exhibit Hall D
1:00 p.m. - 2:00 p.m.	<b>Expo Keynote Session #2</b> La Nouvelle Orleans Ballroom
	 The Honorable Jay Cohen Under Secretary for Science and Technology Department of Homeland Security
2:00 p.m. - 3:00 p.m.	<b>Expo Panel Session</b> - Innovation that Works: Turning Ideas into Opportunities <b>Moderated by:</b> Dr. Neil Thornberry Innovation Chair Naval Postgraduate School (NPS)
	<b>Panelists:</b> Don Cutey Jr., IBM Global Business Development Executive Dr. Marc Ventressa, Naval Postgraduate School Mr. Ron Pierantozzi, Former Vice President, Coporate Venturing
3:00 p.m. - 3:30 p.m.	Coffee Break in Exhibit Hall
3:30 p.m. - 4:30 p.m.	<b>Expo Break-out Sessions: “Innovation that Works”</b> Ernest N. Morial Convention Center
	<b>Expo Break-out Session #1</b> Room TBA; 2nd level <ul style="list-style-type: none"><li>Differentiating Ideas from Opportunities: The Problem with Great Ideas</li></ul>
	<b>Expo Break-out Session #2</b> Room TBA; 2nd level <ul style="list-style-type: none"><li>Creating a Culture of Innovation: Identifying Neutralizing Innovation Killers</li></ul>
	<b>Expo Break-out Session #3</b> Room TBA; 2nd level <ul style="list-style-type: none"><li>The Innovators Within: Identifying &amp; Enabling Innovative People Drivers</li></ul>
	<b>Expo Break-out Session #4</b> Room TBA; 3rd level <ul style="list-style-type: none"><li>Sustaining Innovation: Building Innovation “Engines”</li></ul>
5:30 p.m. - 7:30 p.m.	<b>Annual “Cutter” Expo Reception</b> “Bamboula” Spanish Plaza/Riverwalk (shuttle bus service from convention center to Spanish Plaza)

7:00 a.m. - 5:30 p.m.

7:00 a.m. - 8:00 a.m.

8:00 a.m. - 4:00 p.m.

8:00 a.m. - 5:30 p.m.

8:00 a.m. - 9:00 a.m.

9:00 a.m. - 10:00 a.m.

10:00 a.m. - 10:30 a.m.




10:30 a.m. - 11:30 a.m.

11:30 a.m. - 1:00 p.m.

1:00 p.m. - 3:00 p.m.

3:00 p.m. - 3:30 p.m.

## Wednesday, October 31, 2007

USCG Innovation Expo Attendee Registration Check-in (continues) La Nouvelle Orleans Ballroom Foyer; 2nd level Ernest N. Morial Convention Center	
Continental Breakfast La Nouvelle Orleans Ballroom Foyer	
Exhibitor Registration (continues) Exhibit Hall E foyer; 1st level	
Expo Floor Opens Exhibit Hall E	
<b>Expo Panel Session</b> La Nouvelle Orleans Ballroom Biometrics-at-sea; Mona Passage Proof of Concept <b>Moderated by:</b> Coast Guard Office of Law Enforcement & Biometrics Team	
<b>Expo Panel Session</b> Leading from the Middle: Showcasing CG Innovators <b>Moderated by:</b> CAPT Joe Re, USCG, Chairman CG Innovation Council	
<b>Panelists:</b>	LCDR Christopher Kluckhuhn, USCG Mr. Mario Vittone, ASTC LCDR Michael Billeaudeaux, USCG CDR Rick Christoffersen, USCG CDR Gregory Buxa, USCG
Coffee Break in Exhibit Hall	
<b>Expo Keynote Session #3</b> La Nouvelle Orleans Ballroom	
	“SecondLife” Mr. John Lester, “Pathfinder Linden” Linden Labs
Box Lunch Exhibit Hall Exhibit Hall D; 1st level	
<b>Expo Keynote #4</b> La Nouvelle Orleans Ballroom	
	Acquisition Insights & Transformation RADM Gary Blore, USCG, Assistant Commandant for Acquisition
	Acquisition Insights & Transformation Panel Session <b>Moderated by:</b> RDML Ronald Rabago, USCG Director of Acquisition Programs, USCG Acquisition Directorate
<b>Panelists:</b>	Ms. Claire Grady, Mr. Michael Tangora, CAPT Matt Sisson, USCG
Coffee Break in Exhibit Hall	


# USCG Innovation Expo Updated Agenda (continued)

All session times, topics, and speakers subject to change

## Wednesday, October 31, 2007 (continued)

3:30 p.m. - 5:30 p.m.

**Expo Keynote**  
RDML Thomas Atkin, USCG  
Commander, Deployable Operations Group (DOG)

 Panel Session Featuring:  
DOG Components and Operational Commander Panel Session

~ Evening Free - Enjoy New Orleans ~

## Thursday, November 1, 2007

7:00 a.m. - 12:00 noon

USCG Innovation Expo Attendee Registration Check-in (continues)  
La Nouvelle Orleans Ballroom Foyer; 2nd level  
Ernest N. Morial Convention Center

7:00 a.m. - 8:00 a.m.

Continental Breakfast  
La Nouvelle Orleans Ballroom Foyer; 2nd level

8:00 a.m. - 10:30 a.m.

Exhibitor Registration (continues)  
Exhibit Hall E foyer; 1st level

8:00 a.m. - 10:30 a.m.

Expo Floor Opens  
Exhibit Hall E; 1st level

10:00 a.m. - 10:30 a.m.

Coffee Break in Exhibit Hall

10:30 a.m.

**Expo Floor Closes**

11:00 a.m. - 7:00 p.m.

Exhibitor Move-out


10:30 a.m. - 12:00 noon

**USCG Expo Closing Session**  
La Nouvelle Orleans Ballroom


Speakers:

 ADM Thad W. Allen, USCG  
23rd Commandant  
United States Coast Guard

 VADM Vivien S. Crea, USCG  
Vice Commandant  
United States Coast Guard

 VADM Robert J. Papp, Jr., USCG  
Chief of Staff  
United States Coast Guard

USCG Innovation Award Presentations

The National Graduate School  
 Honorary Doctorate presented to ADM Allen

Closing Remarks by ADM Thad Allen, USCG

## Thursday, November 1, 2007

12:00 p.m.

2007 USCG Expo Adjourns

Citizen's Action Network

*Putting the "Home"  
in Homeland  
Security*



- "The maritime threat environment of the 21st Century *requires* broader scope and a more comprehensive vision.
- We *must* look beyond traditional surveillance of ports, waterways, and oceans, and continuously adapt to new challenges and opportunities.
- We *must* set priorities for existing and developing capabilities to efficiently minimize risks while contending with an uncertain future."
- *The National Plan to Achieve Maritime Domain Awareness for the National Strategy for Maritime Security Oct 2005*



# Current State of Citizen's Action Network

**"The vastness and complexity of the maritime domain make public and private partnerships a prerequisite of preparedness and effective response."**

*Vice Admiral Thad W. Allen before the Senate Committee on Commerce, Science & Transportation March 9, 2006*

1 Coast Guardsman for every 2 miles of shoreline

**45,000 Active Duty Coast Guardsmen**



# Questions?





# U.S. Coast Guard Current Border Security Initiatives:

## Biometrics at Sea



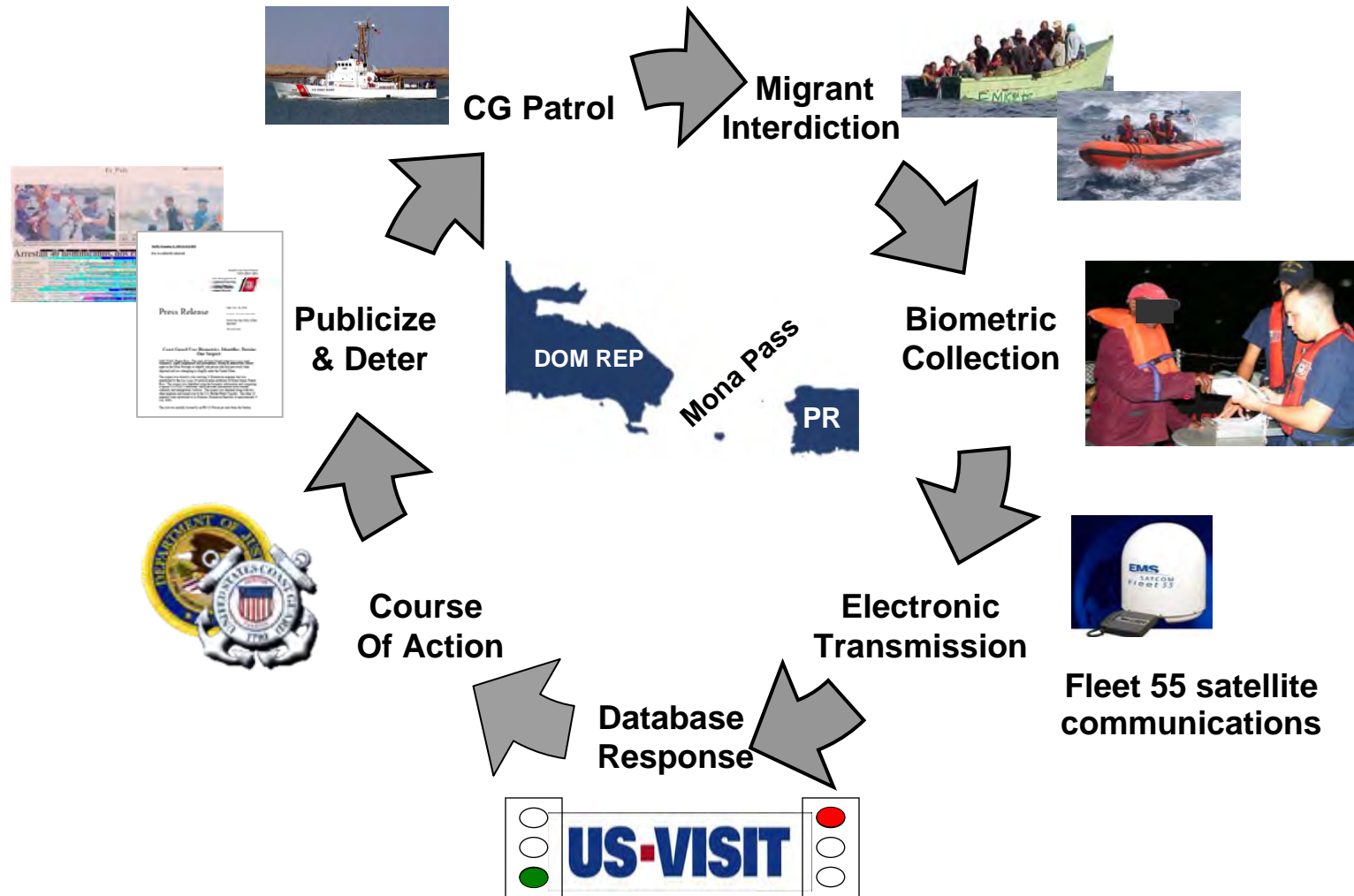
Homeland  
Security

# Biometrics

## Pilot Operational Area



# Biometric Process Cycle



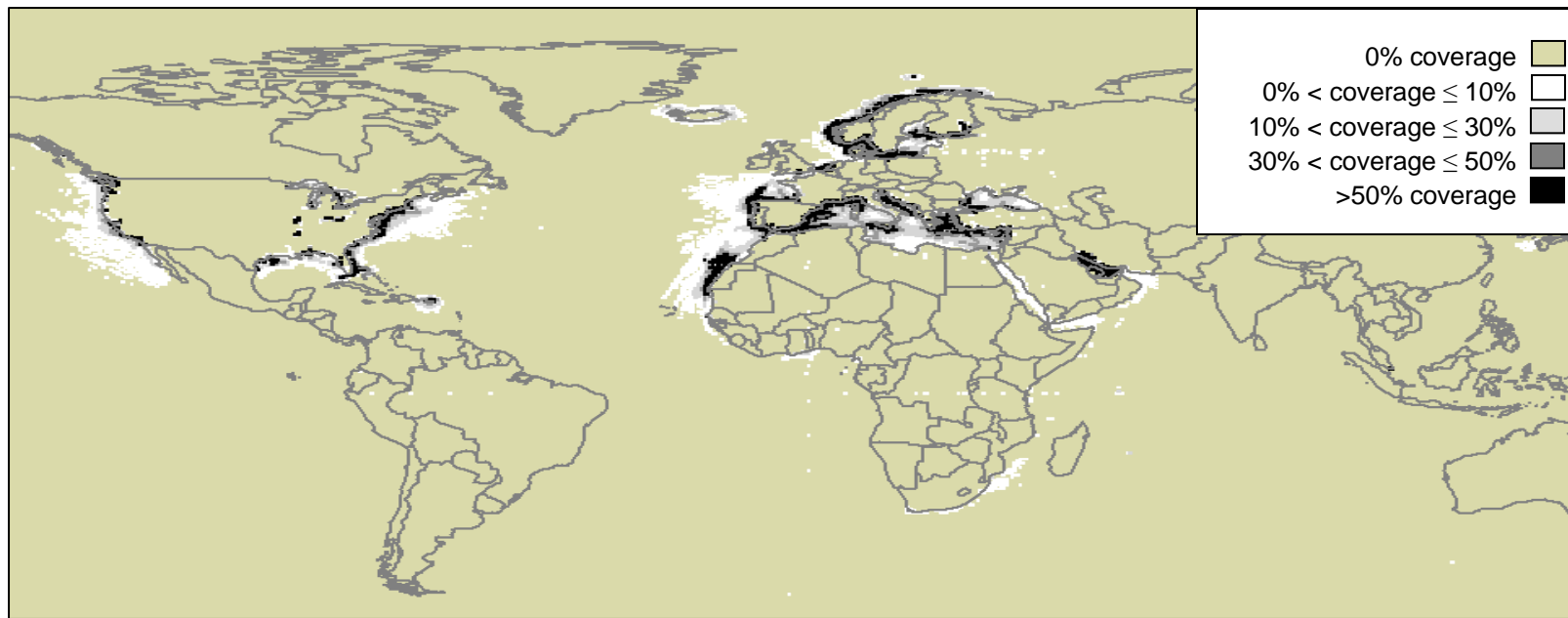


Homeland  
Security

# ***Maritime Security and Safety Information System***



**October 29, 2007**



**CDR Ric Callesen**  
**Director, TMFC**  
**CNE-C6F**



# *Topics*

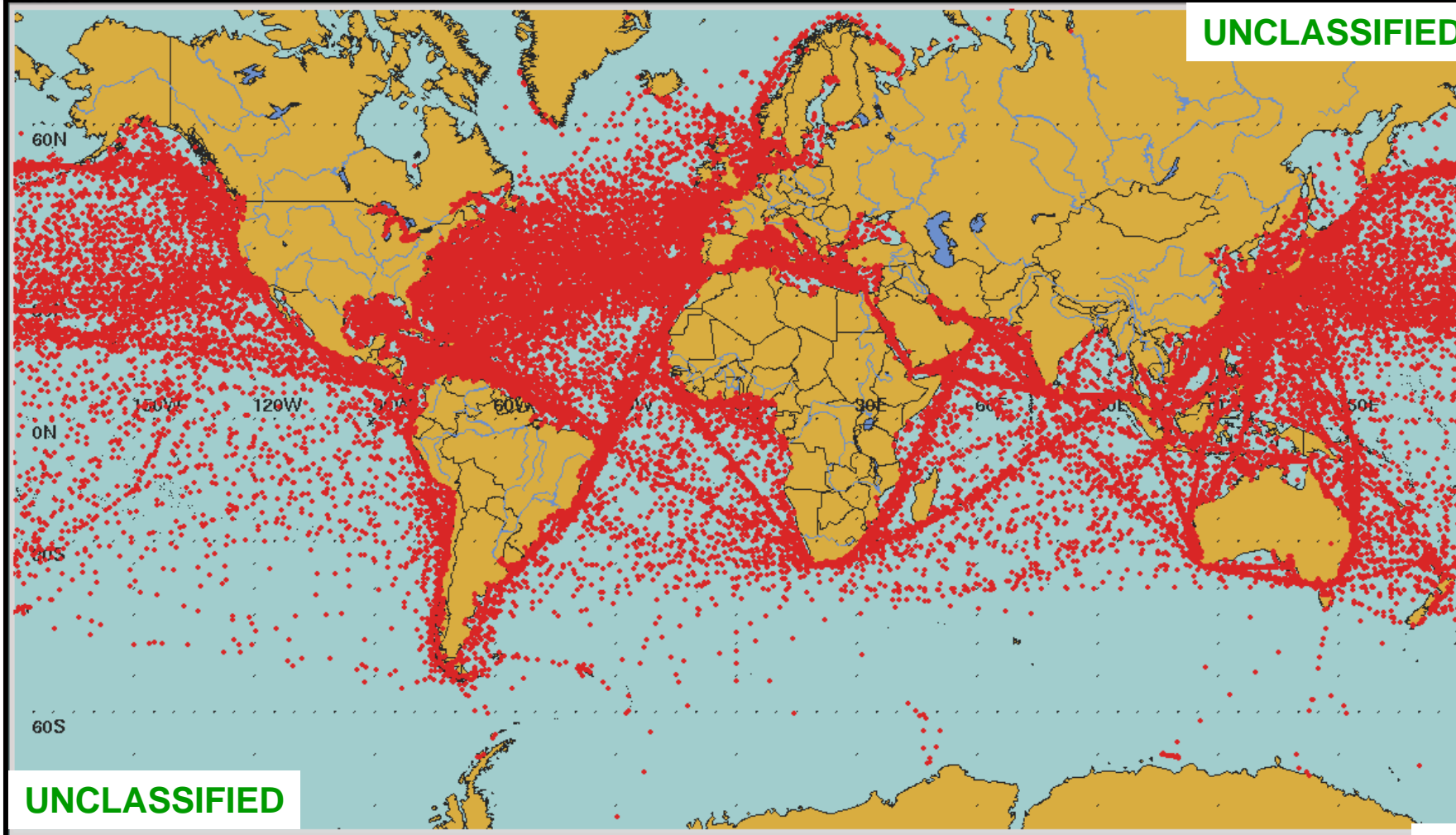


- ✓ **Challenge**
- ✓ **Guiding Principles**
- ✓ **Direction**
- ✓ **Idea**
- ✓ **Big Idea**
- ✓ **MSSIS**
- ✓ **MSSIS Africa**
- ✓ **RMAC**
- ✓ **MSSIS Progression**
- ✓ **MSSIS in the National Effort**

# *The Challenge*



UNCLASSIFIED



UNCLASSIFIED



# ***Guiding Principles for MDA***



- ***Regional problems require regional solutions***
- ***Interagency teamwork - Not just navies and traditional partners***
- ***Be Transparent - Share information widely***
- ***Keep it simple, keep it low cost***
- ***Keep it UNCLASSIFIED - Needless classification weakens the network***
- ***Open Architecture – The Tools are Out There***
- ***Network Based - Leverage the Internet***
- ***Provide the software to sort MSA data***



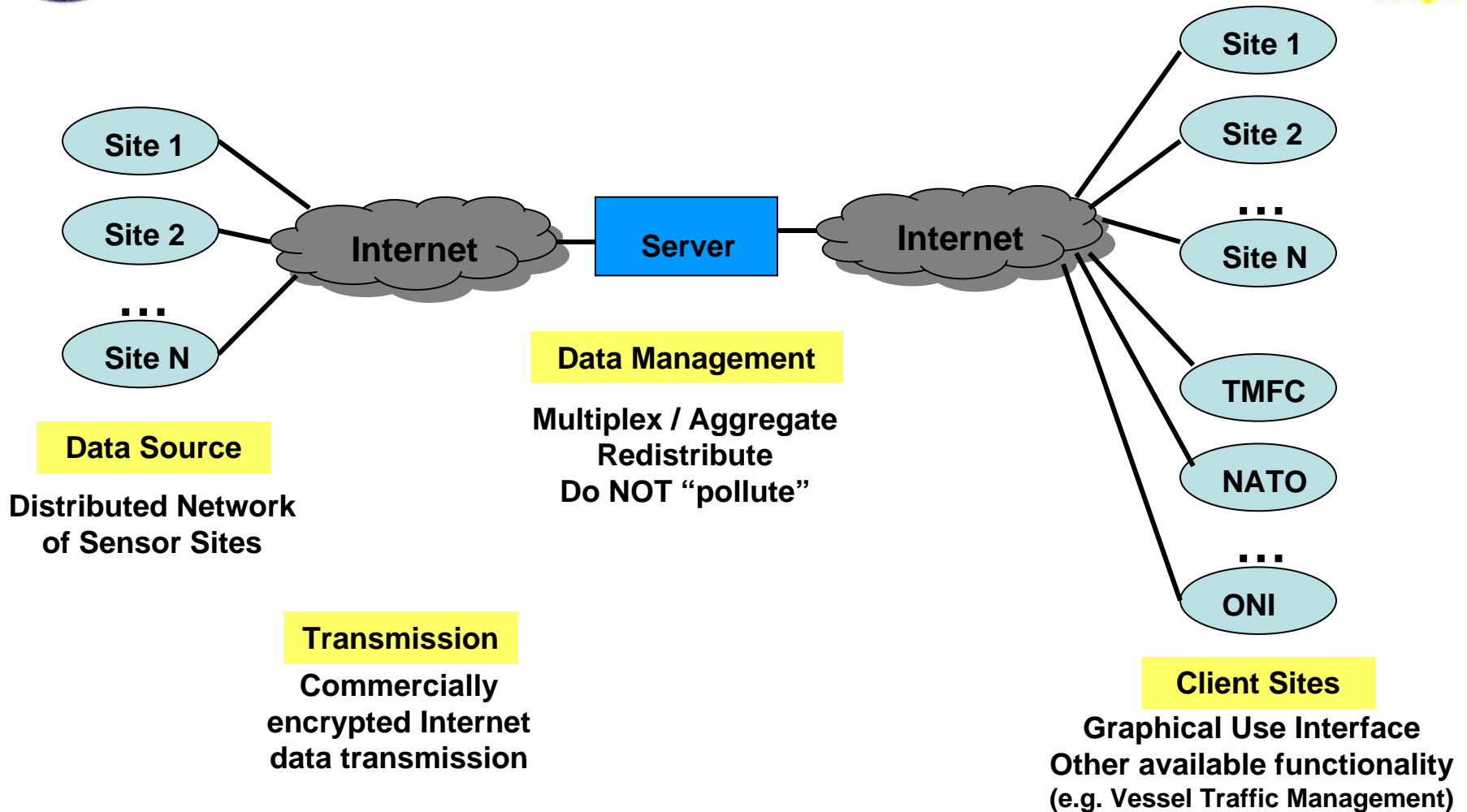
# ***The Direction***



- **Connect our Enduring and Emerging Partners together**
  - **Level the playing field**
  - **Keep it unclassified and Open Source and keep it Freely shared**
  - **No Bi-Lats**
- **Support all National MDA efforts**



# *The Idea ~ July 2005*



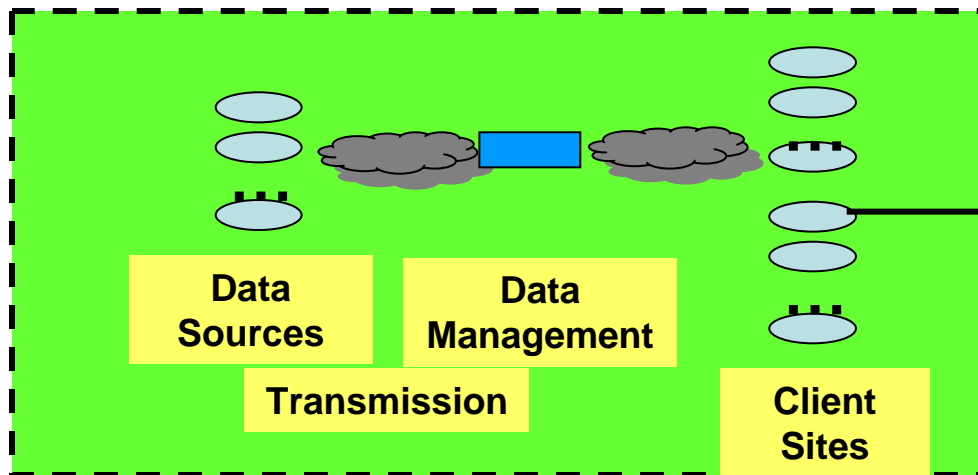




# Big Idea ~ July 2005



## The Green Box

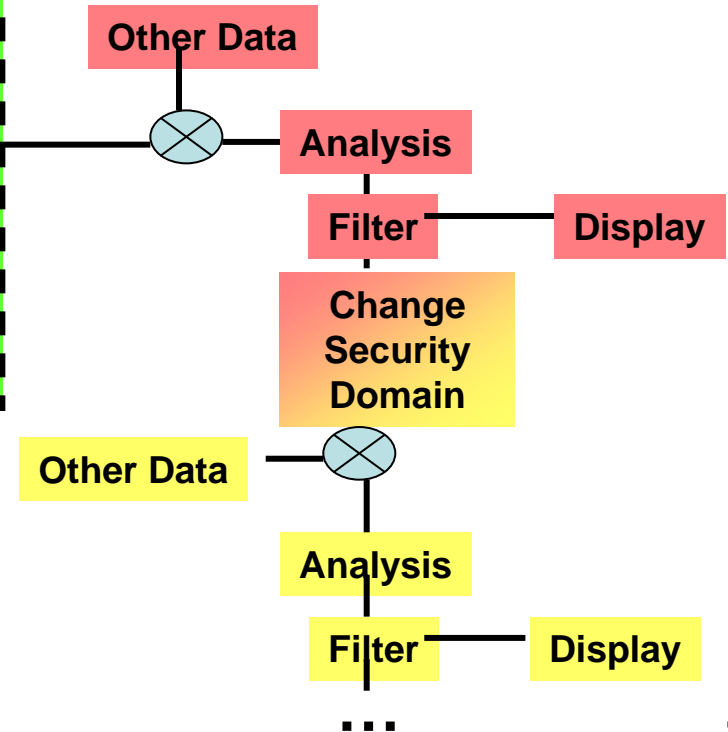


## PRIMARY ATTRIBUTES

- UNCLASSIFIED Data
- Freely SHARED Data (e.g. AIS)
- INTERNET Data Path
- Non-military Data Management

What's done  
"OUTSIDE"

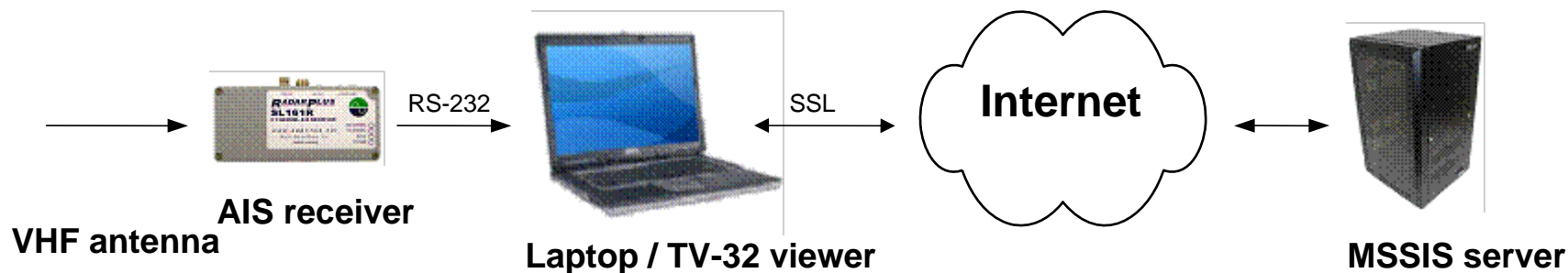
The Data Sharing Framework  
is the Clients' Business



# Maritime Safety and Security Information System (MSSIS)



- **Genesis: US Department of Transportation (DoT)**
  - Network for US Coast Guard with data viewer (TV-32)
- **Simple, unclassified, freely shared, open architecture**
- **Uses Internet to share data**
  - Well-defined international data format (ITU-R M.1371-1)
- **Authorized users access through commercial security**
  - Navies, Coast Guards, agencies, ministries, Border Police, port authorities
  - Password protected with secure socket layer (SSL) encryption



# ***MSSIS Africa - 1206***

- **Obtained \$2.6M in FY07 1206 funding for AIS installations in 15 nations in Africa to participate.**
- **Applied for \$28M in FY08 1206 funding to increase Maritime Security Capability Enhancement (MSCE)**
  - **11 African nations**
  - **MSCE is integrated AIS, Radar, Camera with OP center display and VHF communications capability**

# *Regional Maritime Awareness Capability (RMAC) Joint Capability Technology Demonstration (JCTD)*

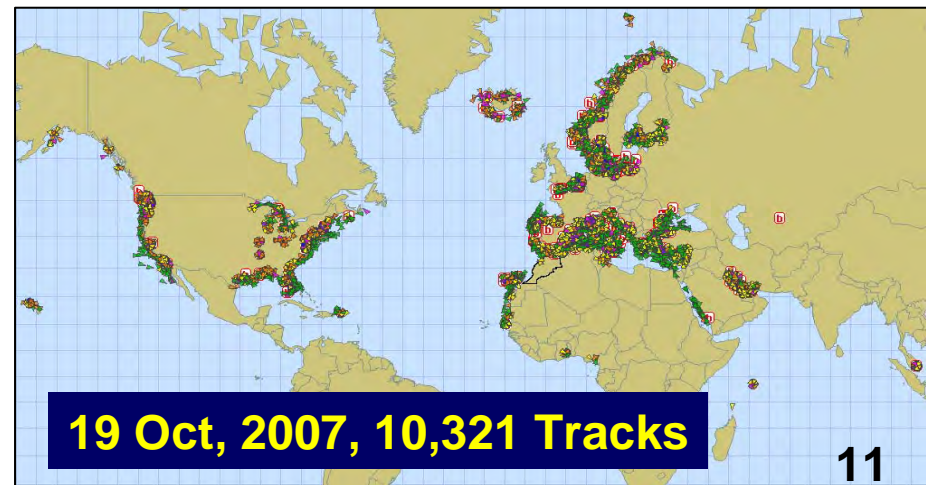
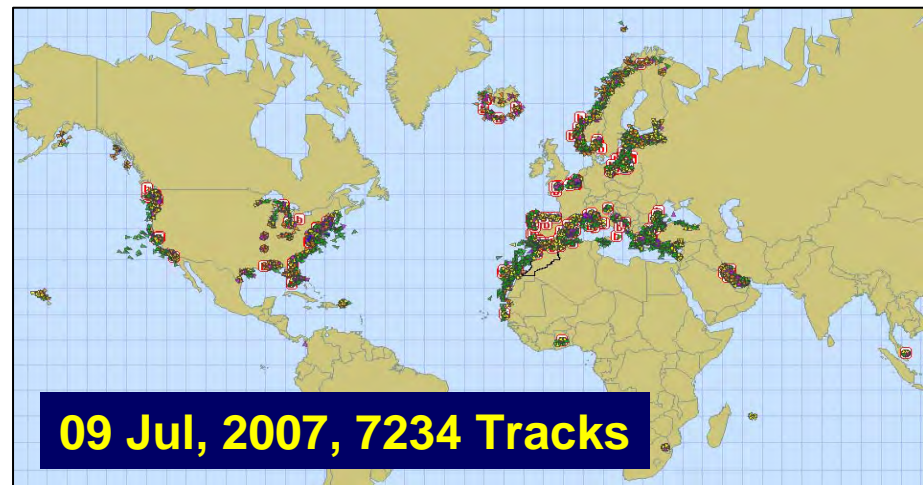
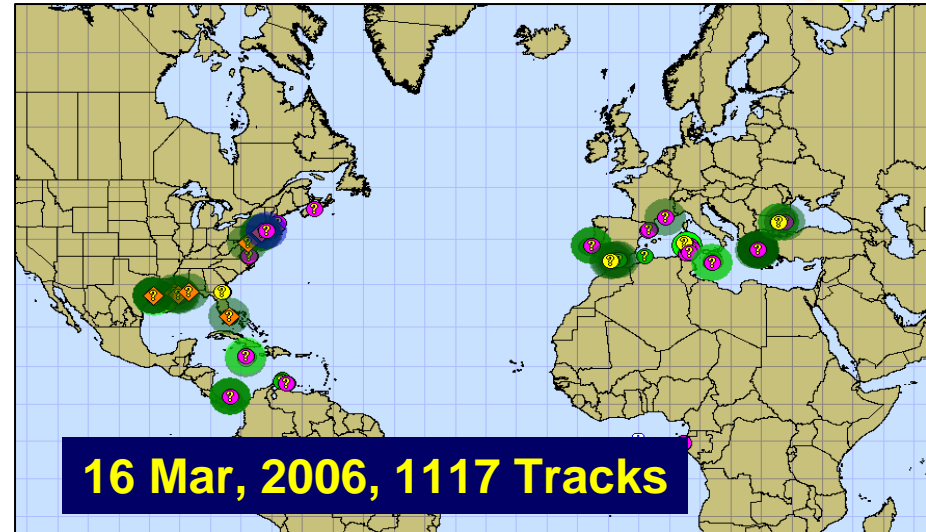
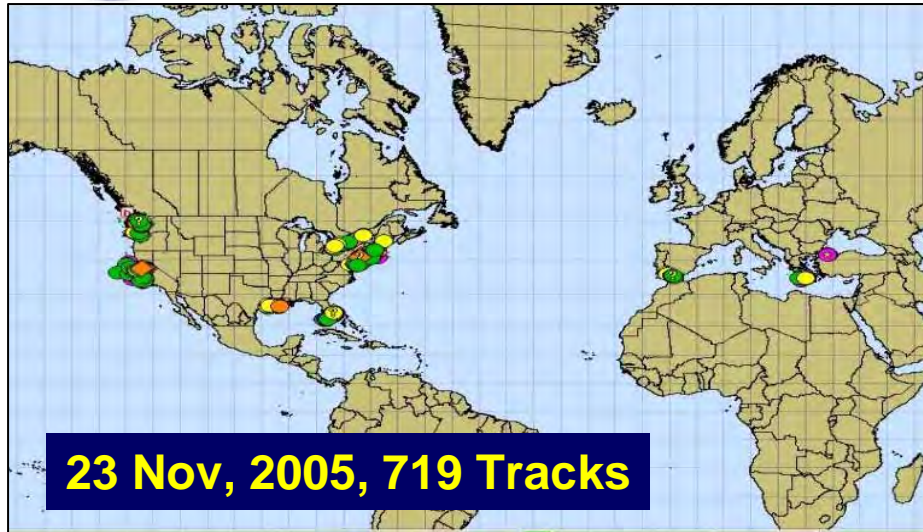


- **History**
  - Directed by EUCOM. Initiated July 2006 – Concluding Sep 2008
- **Synchronization with CNE MDA efforts**
  - Improve Maritime Security and Safety
  - Help to define technology requirements and maritime awareness capabilities for integrating AIS, Radar, and Video into maritime awareness process
- **Current Status and Schedule**
  - **Sao Tome and Principe:** Coast Guard Ops Center executing daily maintenance/trouble-shooting SOPs
    - Installation completed – Nov 07; IOC for Operations Training in mid-Feb 08
  - **Nigeria:** Nigerian OPR in flux; Ops Center equipment ready to be installed.
    - Joint CONOPS – Oct 07; Lagos Install – Dec 07
- **Issues and Prognosis**
  - Technology solution not optimized for Africa/Third World partners/infrastructure
  - JCTD and TSC mission/timelines/success criteria are not good fit
  - Capacity/capability will be demonstrated in Sao Tome; Nigeria will remain problematic.
  - Without US funding to keep capability going long enough (2-3 years) to build budget for country's self-sustainment, capability will not be sustained in either country
  - RMAC will not represent an off-the-shelf solution for future emerging partners.





# Progression of MSSIS







# ***Impediments to Success***



- Data sharing agreements require interagency support
- Distrust of the United States
- Insufficient international regulations
- Non-compliance with international regulations
- Inadequate enforcement of international regulations
- Lack of cooperation among maritime states
- Commercial resistance - mistrust of competitors
- Paucity of sensors





# Complex Shared Challenges



*How can we make our networks stronger than theirs?*



# ***MSSIS Phase Two***



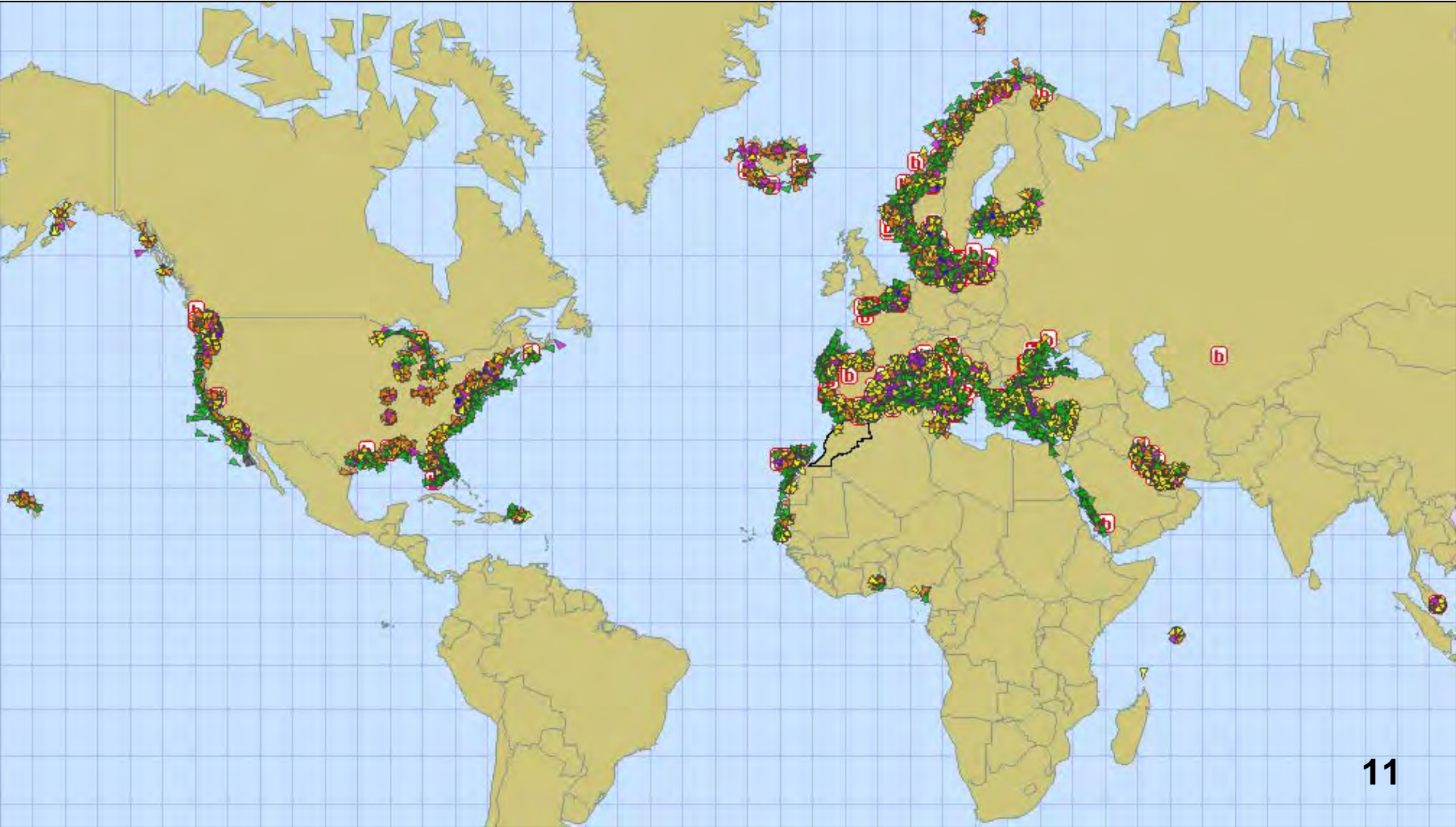
## ***FASTC2AP and BRITE***

- ***Fast C2AP*** is a DARPA-sponsored program demonstrating the application of agent-based technologies to operational information management requirements in support of Maritime Domain Awareness. Fast C2AP was designed to be used by the watch floor operators. DARPA will install Fast C2AP at the Second Fleet's new Maritime Headquarters with Maritime Operations Center.
- ***Baseline for Rapid Iterative Transformational Experimentation (BRITE)*** is a NATO ACT sponsored program is an experimentation framework which allows for the rapid implementation of new ideas and capabilities to support experimentation. BRITE has been developed as part of the TIDE (Technology for Information, Decision and Execution superiority) initiative and is intended to rapidly improve the IT capabilities of the NATO Alliance by reusing existing systems/components and by steering current and future projects towards greater openness and cooperation in a common framework. .



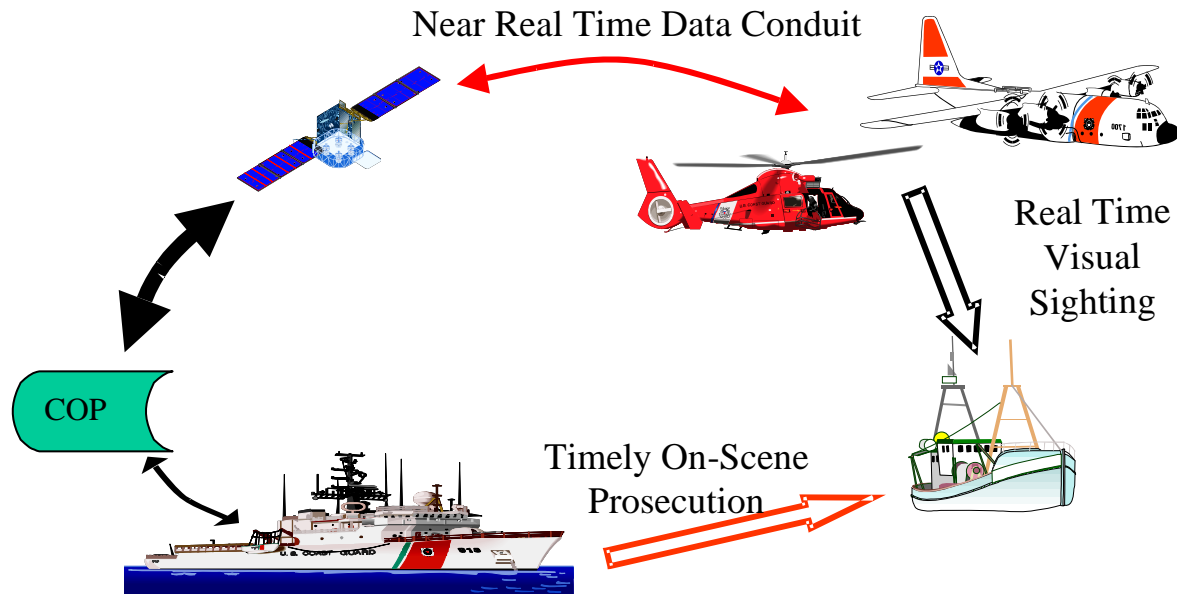


# Comments





# Airborne Data Communication System



CDR Rick Christoffersen



## History

- 2003 - MBP (Team of 5)
- 2004 - COMDT Authorizes Project
- 2007 - Contract with Navy & LM Technology Services



## Scope

- Near-Real-Time exchange of Vessel Sighting Data.
- Automated Asset Tracking

**Sighting Information**

New Sighting Save More... Unit Op. Info Close

Sighting Time (Z): 13 : 09 04/26/20

Lat: 32 0 12.0 S Ex: 45 32.4 N GRS  
 Lon: 077 0 12.0 W Ex: 085 32.4 W Plot on FalconView

Number: 1046707 U.S. Doc Number search: Local  
 Name: NEW RIVER MISLE

Call Sign: Clear Data

Flag: US - UNITED STATES Change Flag

Hailing Port: WILMINGTON State: DE  
 Length: 642. ft.  
 Course: 090 Speed: 12

Activity: UNDERWAY

Colors: Hull: Black Cabin: White

Class Type: Tank Ship  
 Type: Petroleum Oil Tank Ship SANS Port Arrivals  
 Sub Type: Oil Products Tank Ship Notes

**Operating Information**

Close Save Back

Detection Method: Visual

Vsl Call Sign: WTFO Date  
 Last Port: New York, NY 04/01/2004  
 Next Port: Boston, MA 04/30/2004

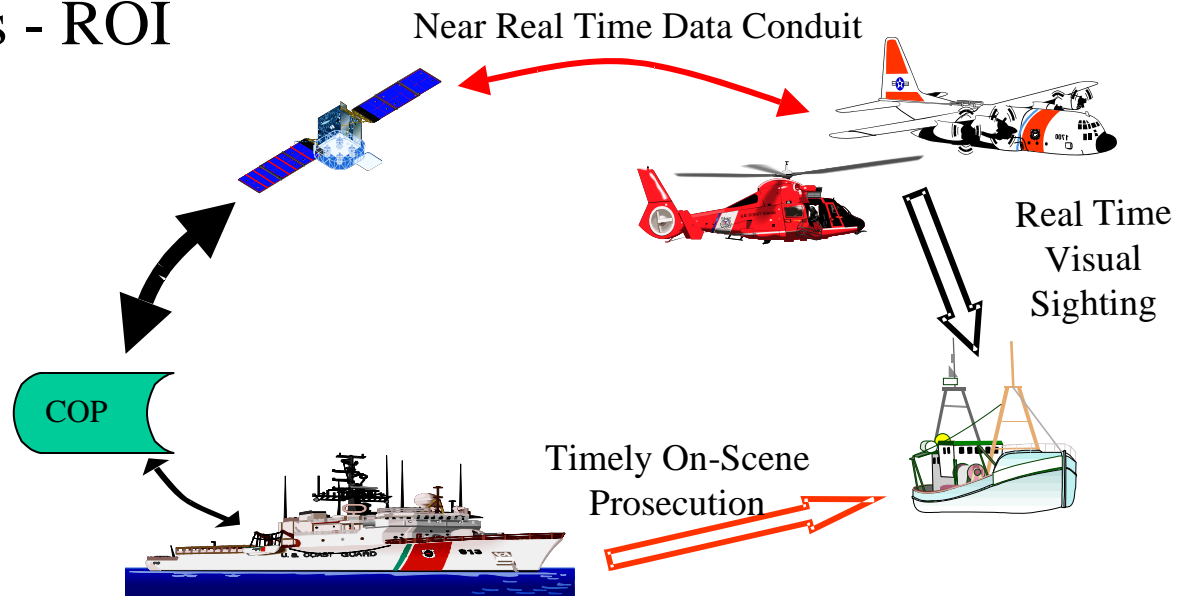
\* Note Date Format mm/dd/yyyy

POB (Adult): 20 # PFDs # Worn  
 POB (Child):

Current Use: ☒ Comm. ☐ Pass. ☐ Pleasure

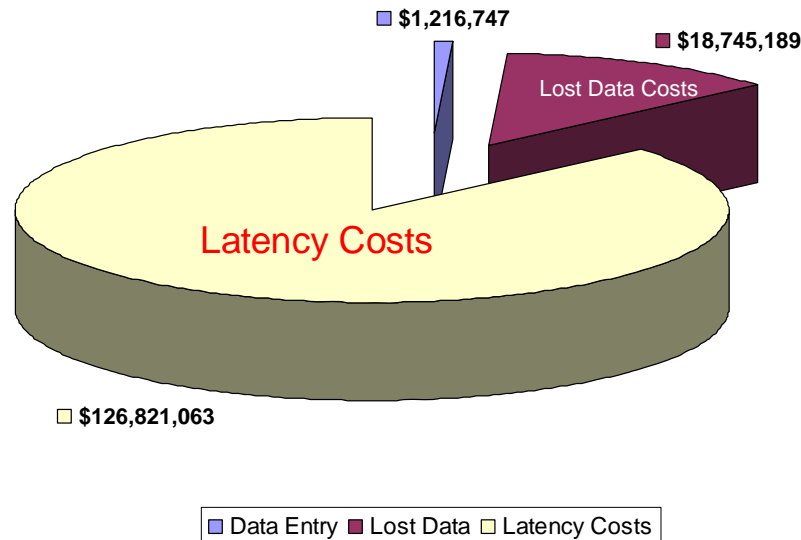
# Great Idea, Great Process, Great Success

- Alignment with Organizational Goals
- Process Analysis
- Cost Driver Analysis
- Stakeholder Alignment
- Tangible Results - ROI



## Cost Driver Analysis - 2003

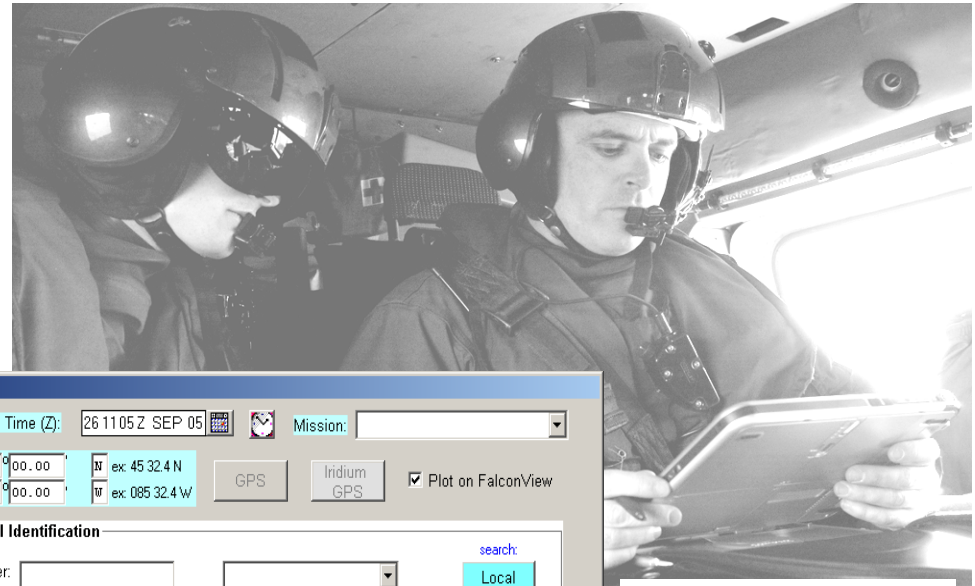
- \$20M in lost sightings and duplicate data entry
- \$127M of LE/MDA aircraft resource hours sub-optimized.



# CG-Mission Planning System



MISLE Lite &  
FalconView



**MISLE Lite - Microsoft Internet Explorer provided by HSC(T)**

File Edit View Favorites Tools Help

Address [http://swdb.osc.uscg.mil/desktop\\_boarding.asp](http://swdb.osc.uscg.mil/desktop_boarding.asp)

**Activity List**

Date/Time	Type	Vessel
05/10/2005 14:28	CFVSE	G-QCC TEST VESSEL
05/11/2005 18:32	Boarding	G-QCC TEST VESSEL

Open Activity New Activity Delete Activity Delete All Print Activity

Vessel Search Export to MISLE Export Activity Import from PDA Export to PDA

Lookout Search References

**MISLE Data Extract**

Vessel Extract G:\MISLE\_Extract.mdb Created: 03/04/2005 Updated: 08/29/2005

Party Extract G:\MISLE\_Parties\_Enc.mdb Created: 03/04/2005 Updated: 08/29/2005

Update Database Get New Extract

Network: **connected** Hull/Tail Number:

☐ Iridium Signal Strength ☒ Send Position with Exports ☐ Send Posits Automatically Send Position 0 ☐ GPS Unit Installed

**Sighting Information**

CG Contact History Violation History Documents SANS Port Arrivals Operating Info Owner / Operator Notes

Sighting Time (Z): 26 1105Z SEP 05 Mission:

Lat:  00.00 N ex: 45 32.4 N  
Lon:  00.00 W ex: 085 32.4 W GPS Iridium GPS ☒ Plot on FalconView

**Vessel Identification**

Number:   Local MISLE

Name:

click here for searching tips: ?

Flag: **US - UNITED STATES** Change Flag

Call Sign:  Length:  ft.

Hailing Port:  State:

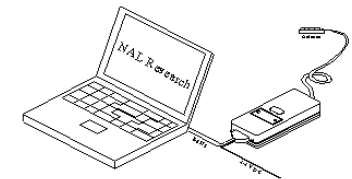
Course:  Speed:

Activity:  Class Type:

Hull Color:  Type:

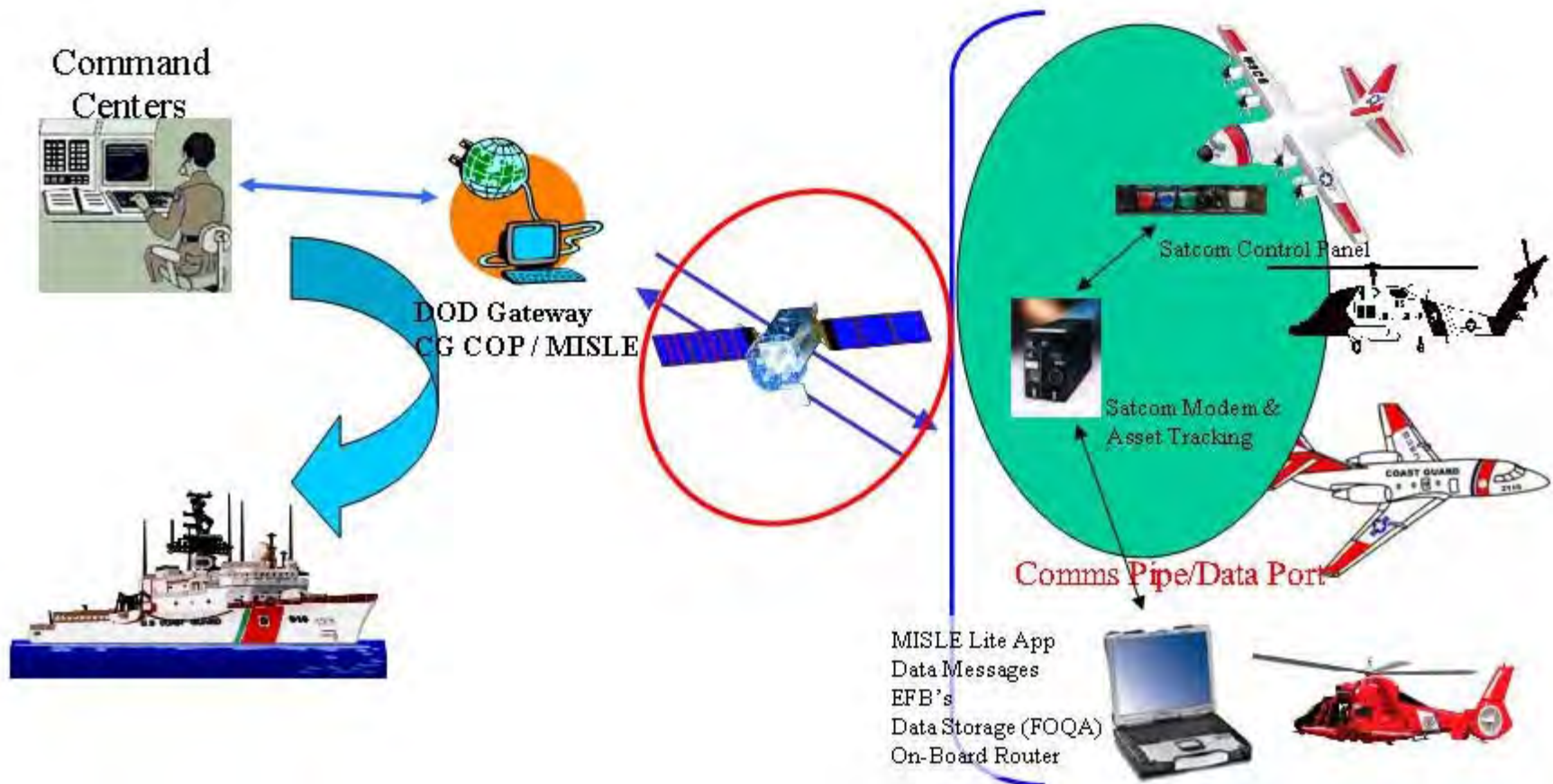
Cabin Color:  Sub Type:

New Sighting Save Clear Data Close



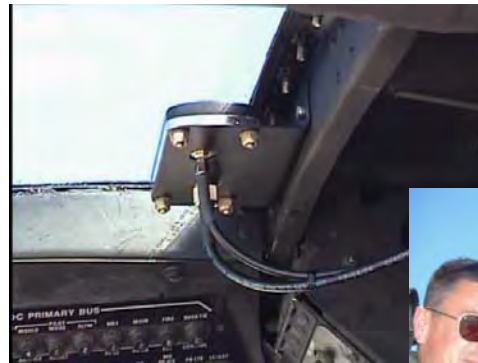


### ADCS “Comms” Architecture







## Proof of Concept

- Airborne Test – 22 Sep 2004
- Passed EMI Soft-test
- Maintained comms link in forward flight –
  - 120kts
  - 30 degrees angle of bank
- Transmitted data to MISLE & COP
- ~Time to displayed on COP: 57 seconds



## Return On Investment

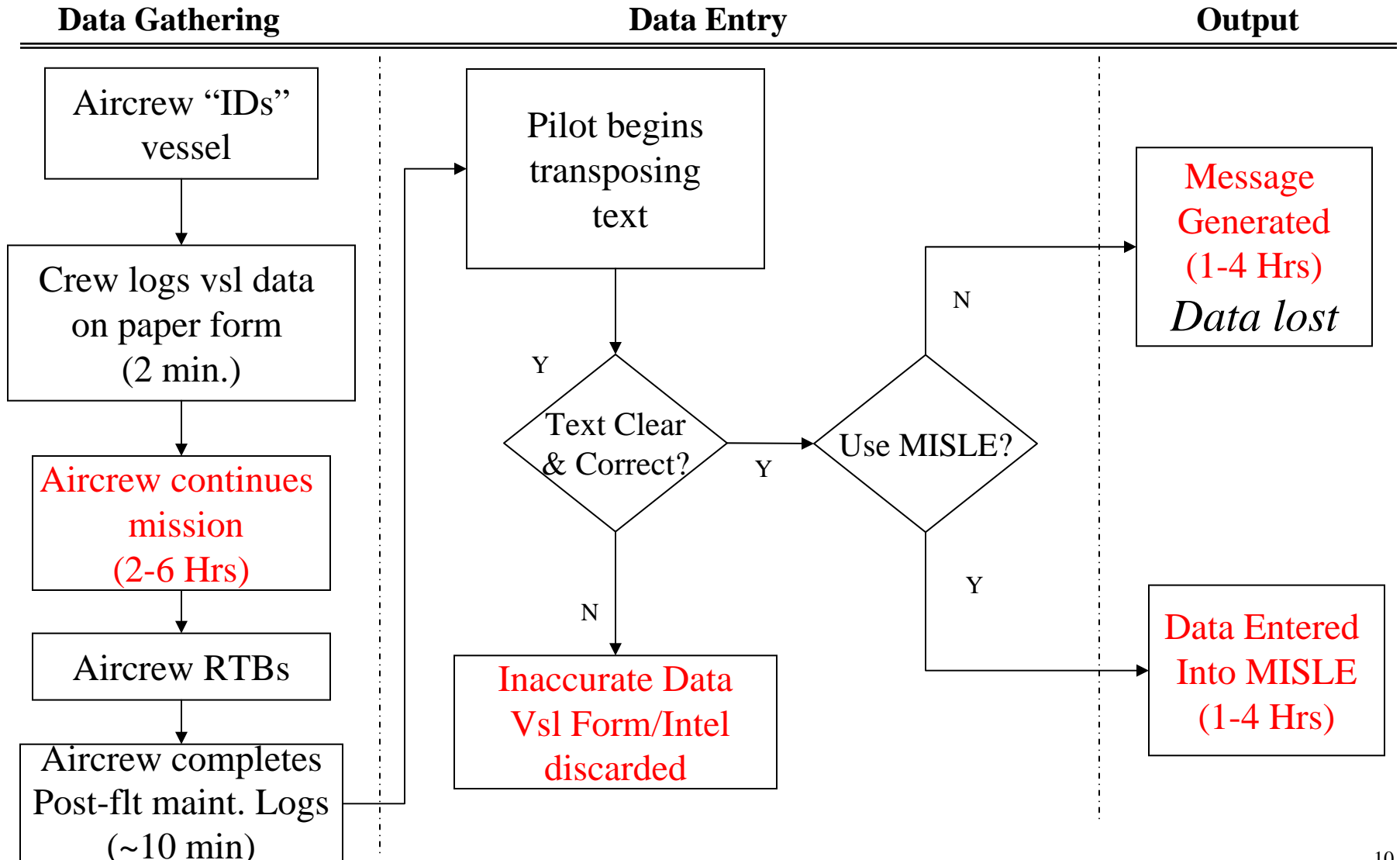
Note: 2003/2004 stats	Before	After		Advantages
<b>Asset Status</b> (Asset Position Reports)	Voice 15/30min (Radio & Paper)	Automated into COP (SPS 3.3.x Information Exchange)		Timeliness Accuracy Safety
<b>Process Steps</b> (VSL ID to data entry)	34	13		21 Less Steps
<b>Cycle Time</b> (Data Transfer)	210 Minutes (3.5 hours)	< 5 Minutes		98% Faster Cycle Time
<b>Costs</b> (Latency & Lost Data)	\$146.7 M (Waste)	\$8.5 M (Project Cost)		<b>ROI</b> <b>83:1</b>



- MISLE Lite Pgm Mature
- Comms Pathway Dev'l
- MISLE data feeds COP
- COTS products
- Common Avionics System
- ADCS C-130 contract

**CDR Rick Christoffersen**



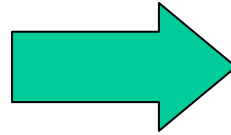




## Linkages

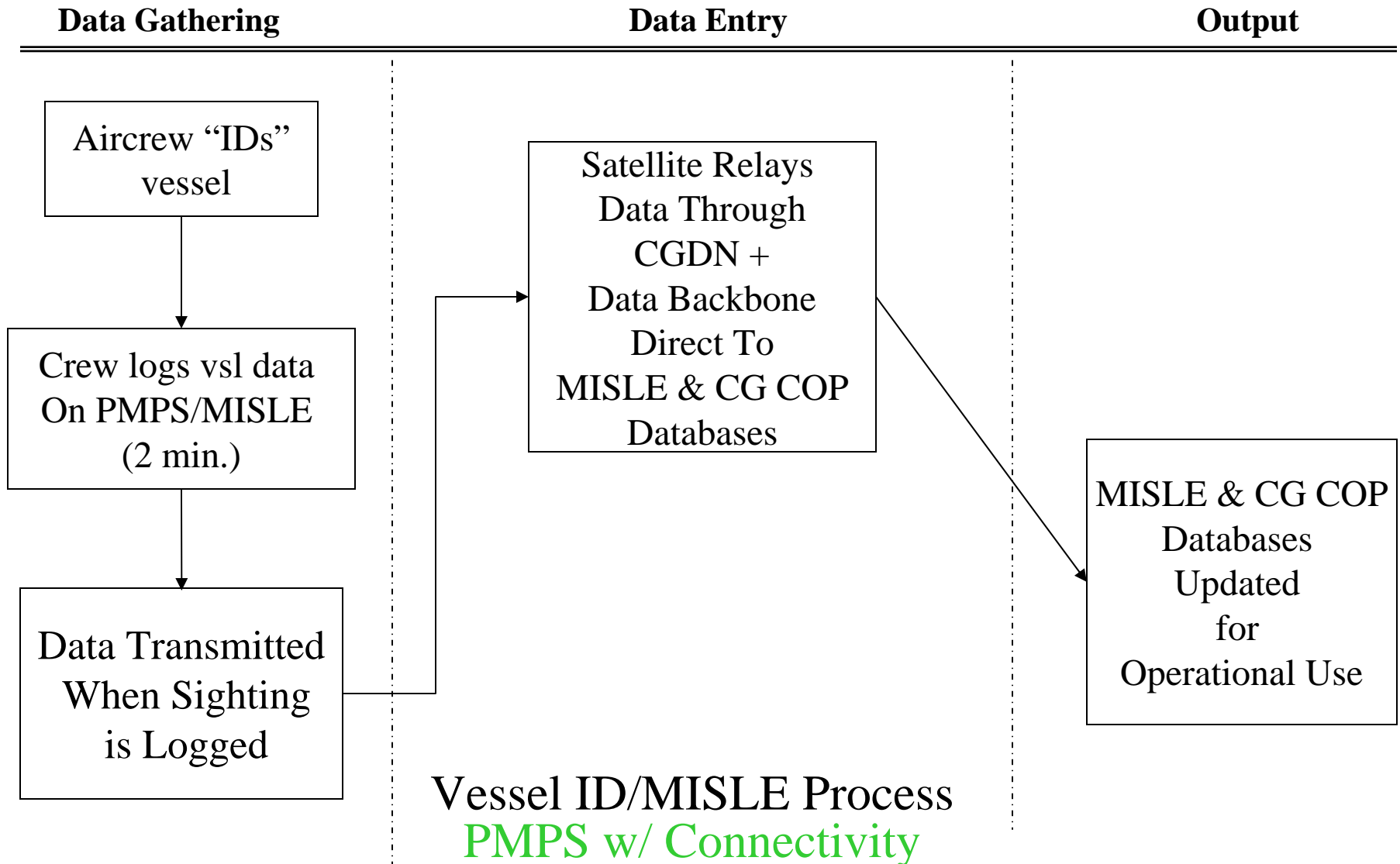
### Project Goals

- Near-Real Time Data Exchange
- Connectivity
- Data Integrity



### Organizational Goals

- Mission Effectiveness
- Operational Excellence
- Enhanced MDA
  - ALCOAST 160/04  
(Est. MDA Office)
  - CG COP/MISLE



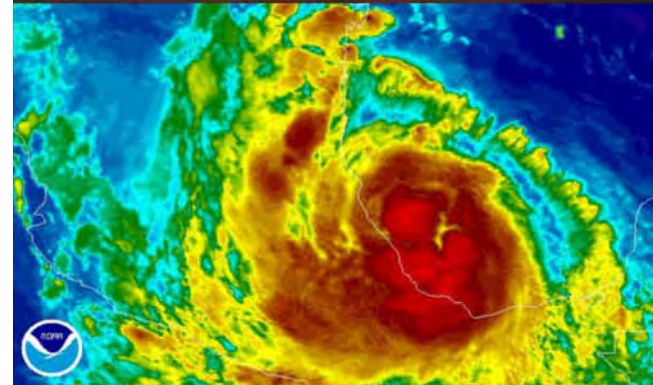
# U.S. Department of Homeland Security

## 2007 U.S. Coast Guard Innovation Expo

October 30, 2007 • New Orleans, Louisiana

Presented by:

Jay M. Cohen  
Under Secretary for Science and Technology  
U.S. Department of Homeland Security



# Homeland Security





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# U.S. Coast Guard Cutter *Eagle*



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# One Year Ago

## **The Senate said:**

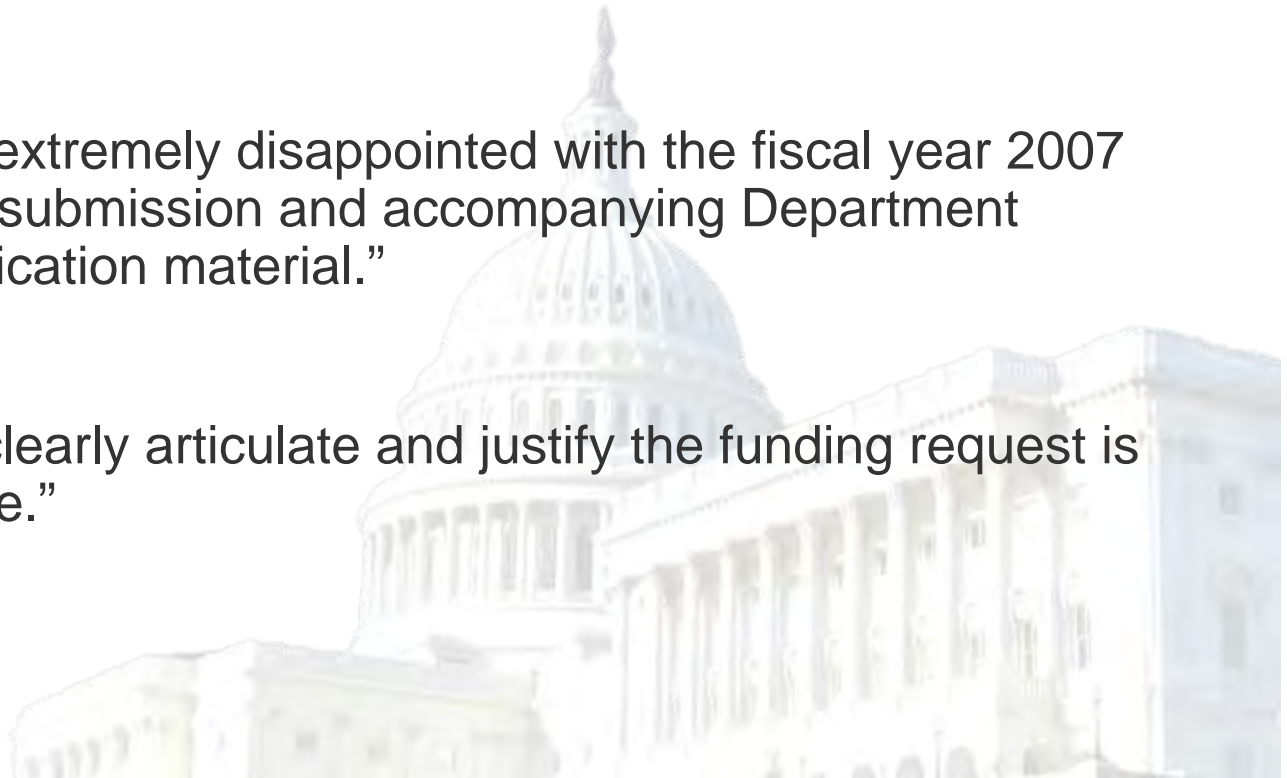
“This component is a rudderless ship without a clear way to get back on course.”

“The Committee is extremely disappointed with the fiscal year 2007 President’s budget submission and accompanying Department congressional justification material.”

“Not being able to clearly articulate and justify the funding request is simply unacceptable.”



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# S&T Goals

## *Consistent with the Homeland Security Act of 2002*

- Accelerate delivery of enhanced technological capabilities to meet requirements and fill capability gaps to support DHS Agencies in accomplishing their mission
- Establish a lean and agile GS-manned, world-class S&T management team to deliver the technological advantage necessary to ensure DHS Agency mission success and prevent technology surprise
- Provide leadership, research and educational opportunities and resources to develop the necessary intellectual basis to enable a national S&T workforce to secure the homeland

# DHS S&T Investment Portfolio

Balance of Risk, Cost, Impact, and Time to Delivery

<b>Product Transition (0-3 yrs)</b> <ul style="list-style-type: none"><li>▪ Focused on delivering near-term products/enhancements to acquisition</li><li>▪ Customer IPT controlled</li><li>▪ Cost, schedule, capability metrics</li></ul>	<b>Innovative Capabilities (1-5 yrs)</b> <ul style="list-style-type: none"><li>▪ High-risk/High payoff</li><li>▪ “Game changer/Leap ahead”</li><li>▪ Prototype, Test and Deploy</li><li>▪ HSARPA</li></ul>
<b>Basic Research (&gt;8 yrs)</b> <ul style="list-style-type: none"><li>▪ Enables future paradigm changes</li><li>▪ University fundamental research</li><li>▪ Government lab discovery and invention</li></ul>	<b>Other (0-8+ yrs)</b> <ul style="list-style-type: none"><li>▪ Test &amp; Evaluation and Standards</li><li>▪ Laboratory Operations &amp; Construction</li><li>▪ Required by Administration (HSPDs)</li><li>▪ Congressional direction/law</li></ul>

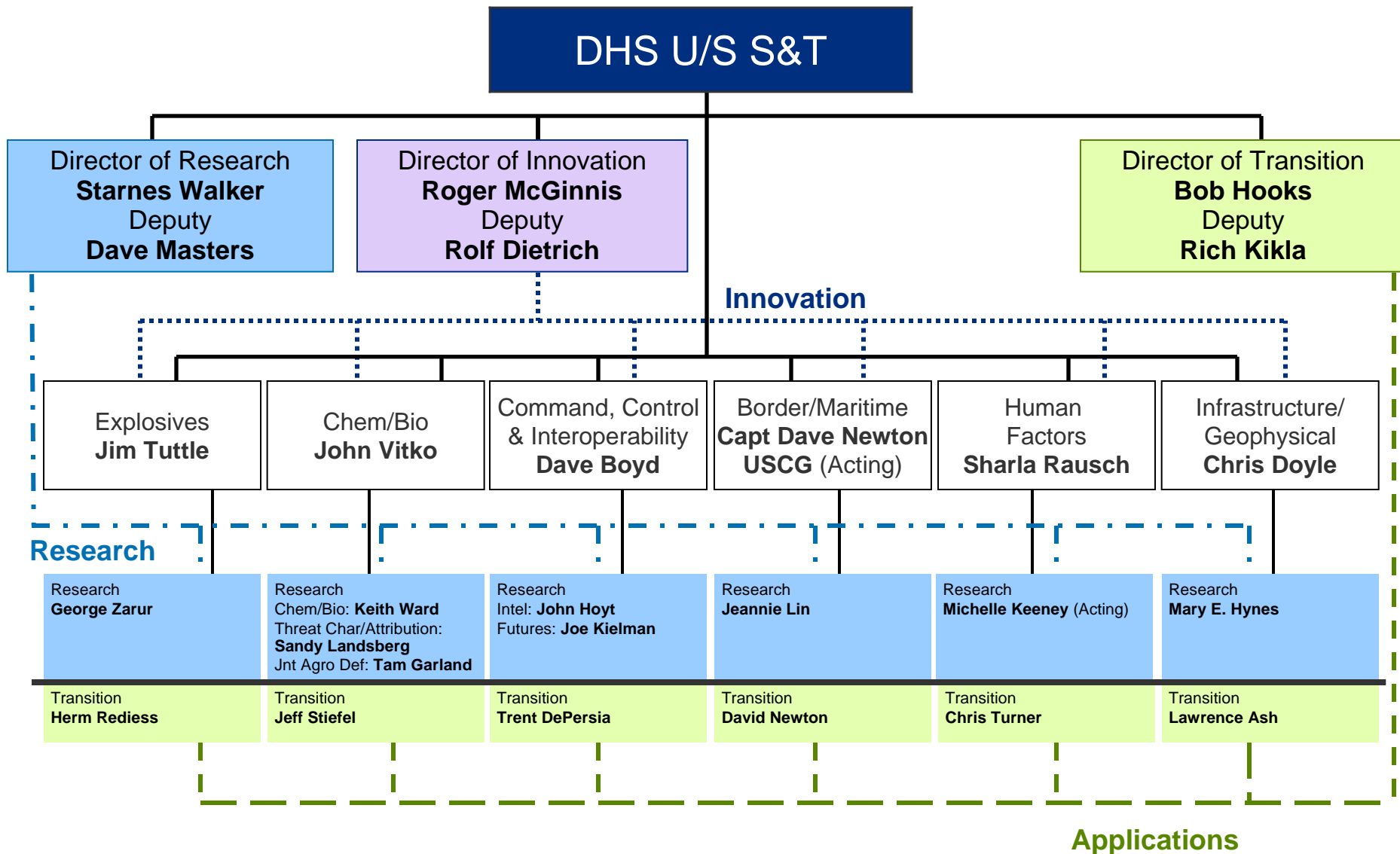
**Customer Focused, Output Oriented**



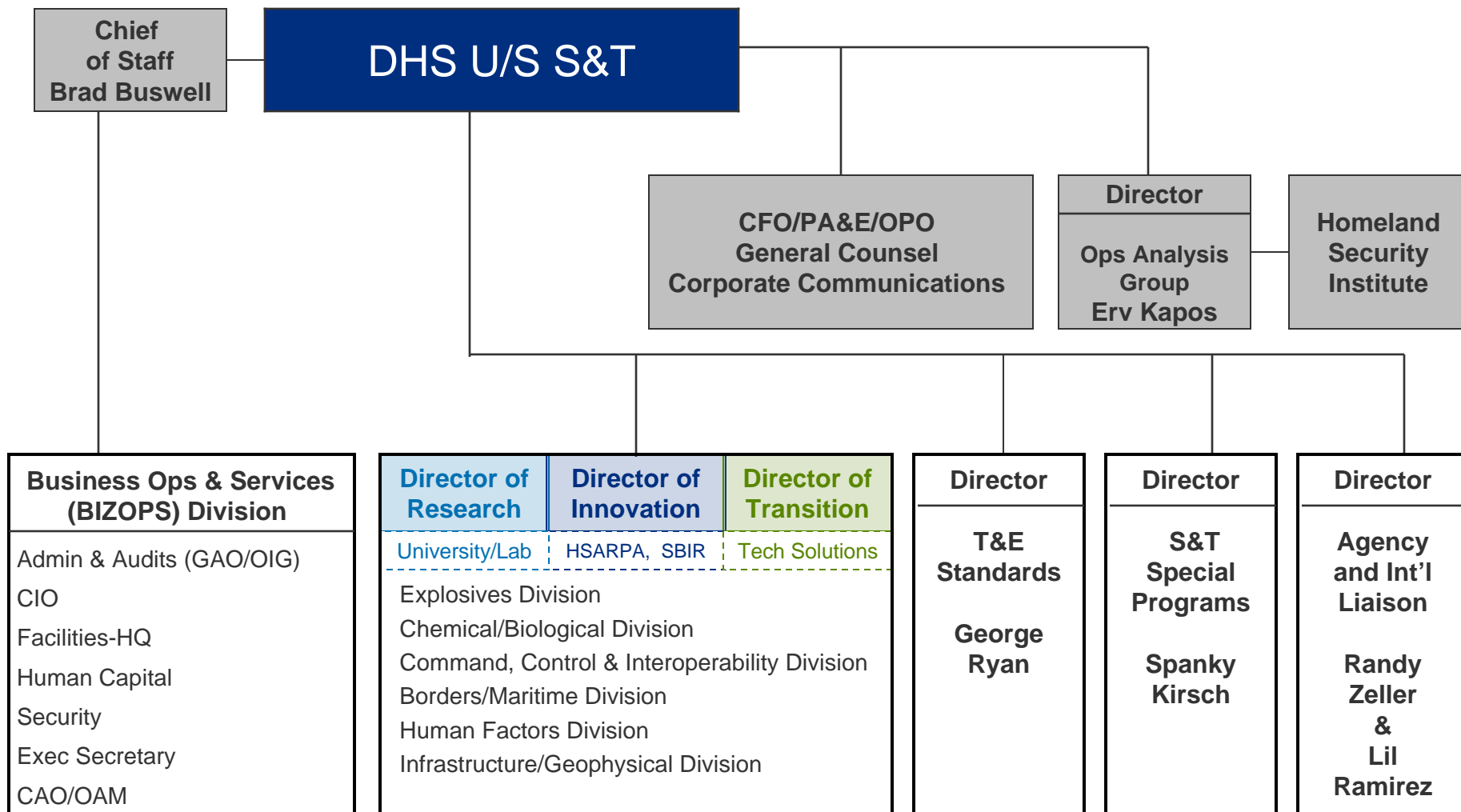
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**Bombs – Borders – Bugs – Business**

# S&T Organization



# DHS S&T Directorate



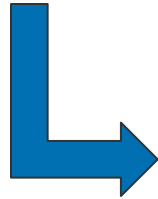
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# Timeline: Re-Org to Reprogramming Funds



- AUG/SEP/OCT 2006 - Briefed all six DHS House and Senate Oversight Committees on new DHS S&T organization and portfolio content



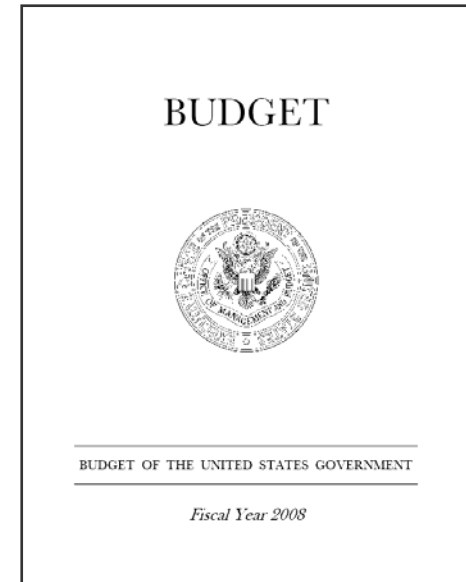
- Early OCT 06 - OMB directs PRESBUD FY08 that reflects revised S&T portfolio content



- Late OCT 06 House & Senate DHS Committees request DHS S&T submit an “omnibus reprogram” in order to reflect new DHS S&T portfolio content (submitted DEC 06) to “kickstart” S&T Innovation

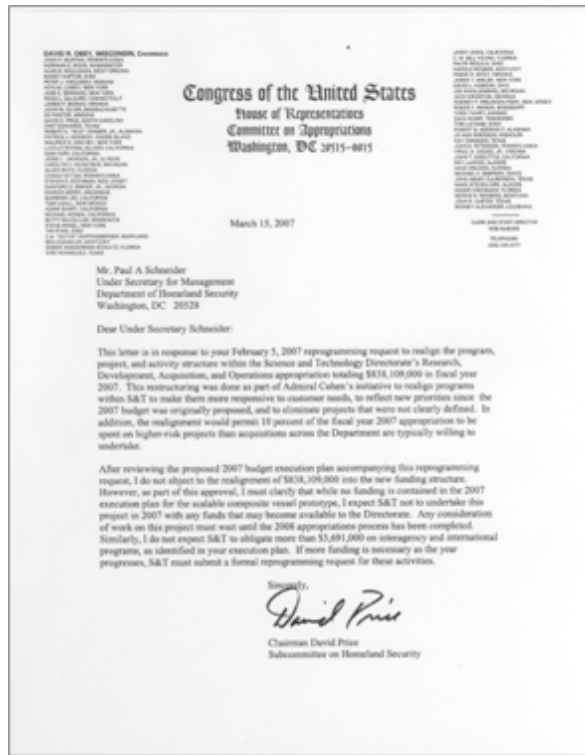


- March 2007 - Congressional approval to reprogram S&T funds



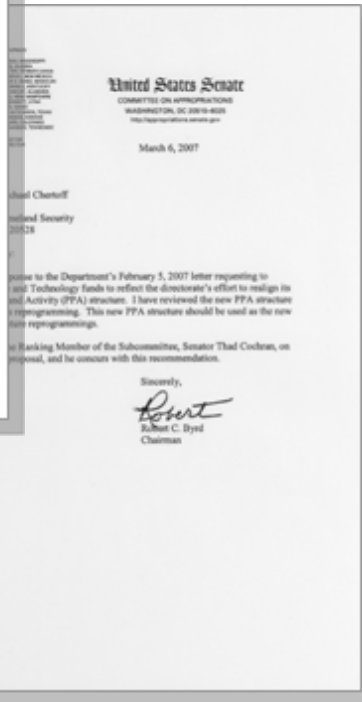
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# Bi-Partisan Congressional Leadership Reprogramming of DHS S&T FY07 Funds to “kickstart” effort to make the Nation safer before FY08!



“After reviewing the proposed 2007 budget execution plan accompanying this reprogramming request, I do not object to the realignment of \$838,109,000 into the new funding structure.”

— *David Price, Chairman, House Committee on Appropriations, Subcommittee on Homeland Security, March 15, 2007*



“I have reviewed the new Program, Project, and Activity (PPA) structure and approve of this reprogramming. This new PPA structure should be used as the new baseline for any future reprogrammings.”

— *Robert C. Byrd, Chairman, Senate Committee on Appropriations, March 6, 2007*



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# Today

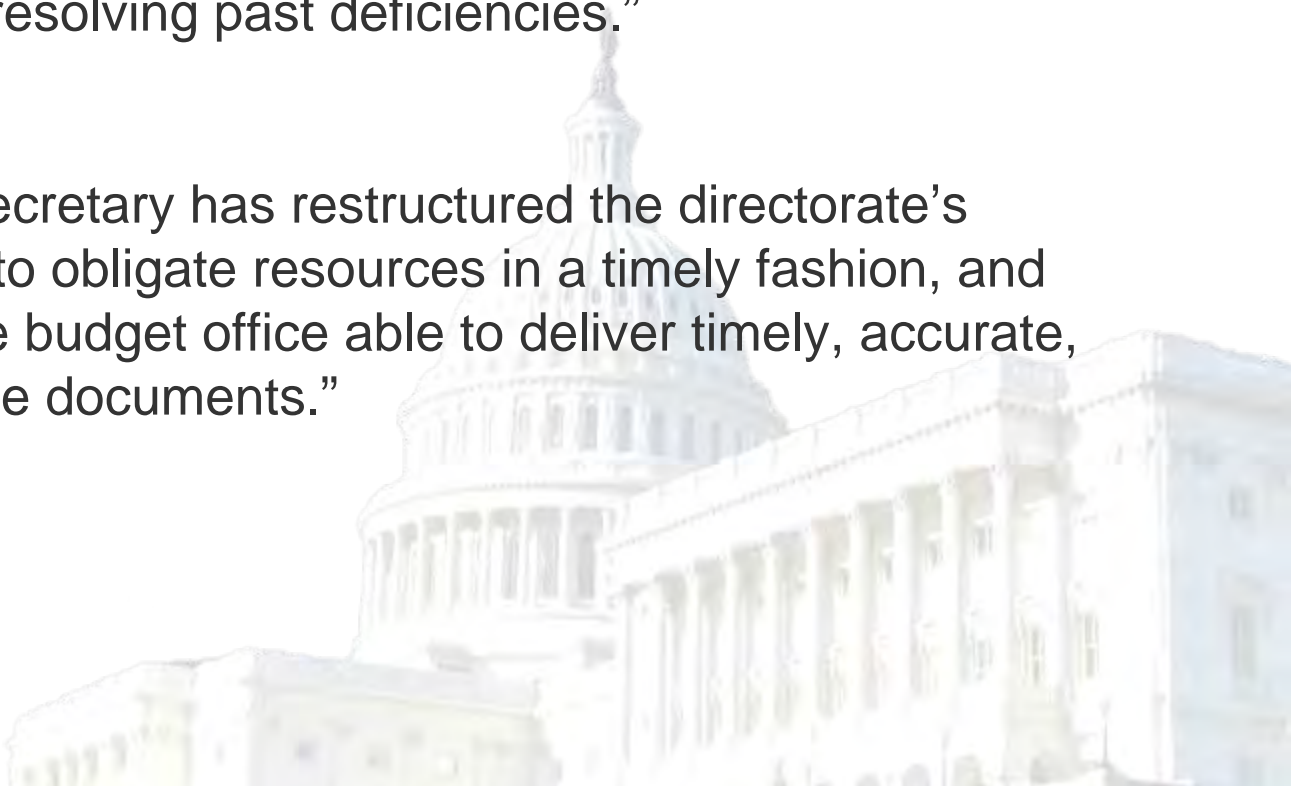
## **The Senate says:**

“The Committee is pleased with the rapid progress S&T appears to be making toward resolving past deficiencies.”

“The new Under Secretary has restructured the directorate’s programs, worked to obligate resources in a timely fashion, and instituted a capable budget office able to deliver timely, accurate, and comprehensible documents.”



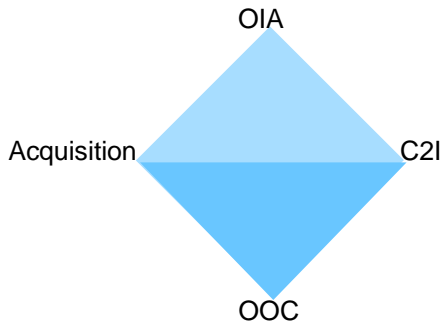
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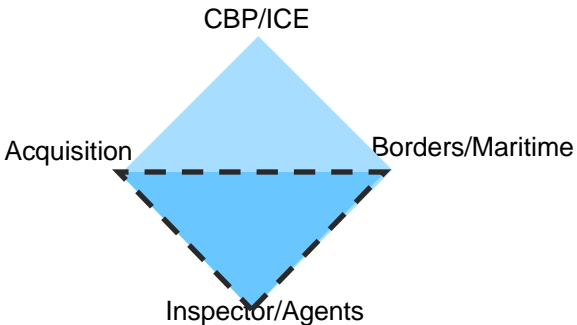
# DHS Requirements/Capability Capstone Integrated Product Teams

## DHS S&T Product – “Enabling Homeland Capabilities”

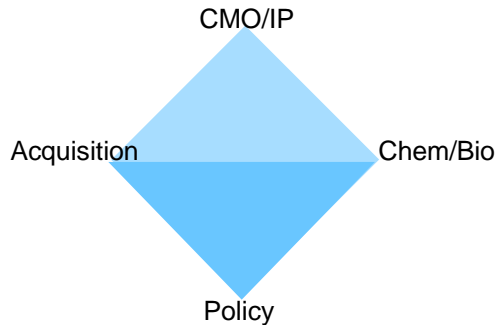
### Information Sharing/Mgmt



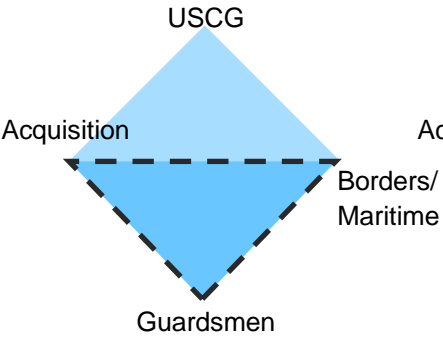
### Border Security



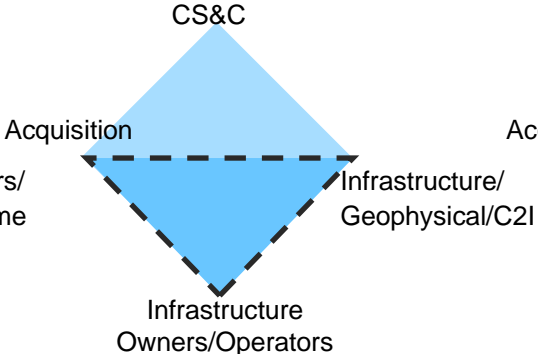
### Chem/Bio Defense



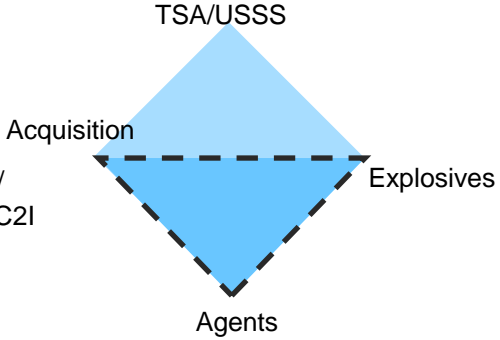
### Maritime Security



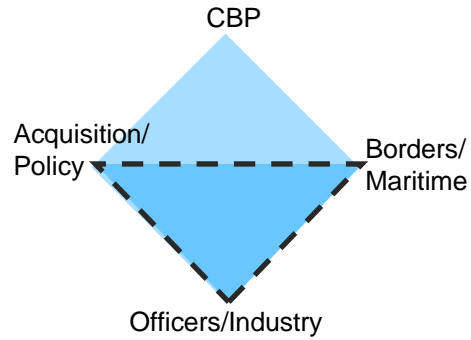
### Cyber Security



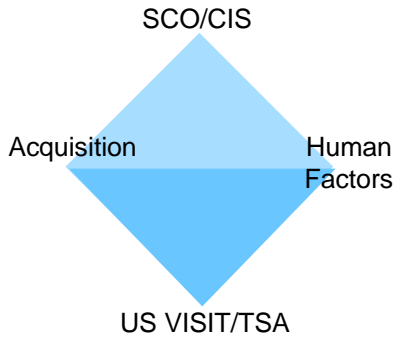
### Explosive Prevention



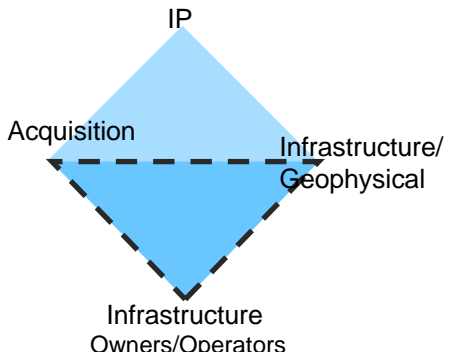
### Cargo Security



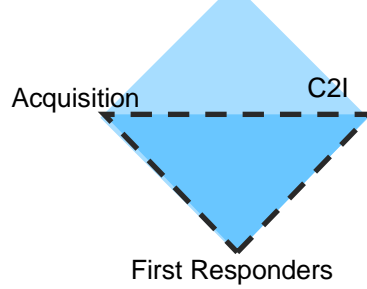
### People Screening



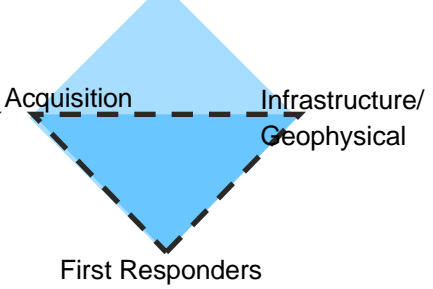
### Infrastructure Protection



### Incident Management *Interoperability* FEMA/OEC



### *Prep & Response* FEMA



# Capstone IPTs defined requirements and customer capability gaps NOW to Fill Those Gaps, Project IPTs Need to Engage

## Information Sharing/Mgmt

- Information Fusion and Visualization to Support the Common Operating Picture (COP)
- Network Identity Management
- Cross-Agency Information Sharing

(19)

## Border Security

- Border Officer Tools and Safety
- Sensor and Data Fusion
- Border / Maritime Domain Awareness Technologies

(50)

## Chem/Bio Defense

- Agrodefense
- Biodefense
- Chemical Defense

(42)

## Maritime Security

- Border Officer Tools and Safety
- Sensor and Data Fusion
- Border / Maritime Domain Awareness Technologies

(32)

## Cyber Security

- Research Tools & Technology
- Information Infrastructure Protection
- Next Generation Technologies

(12)

## Explosive Prevention

- Standoff Detection
- Homemade Explosives
- Checked Baggage
- Check Point
- Response
- Canine explosive detection
- Blast Mitigation
- Standoff Projectile Mitigation

(45)

## Cargo Security

- Container Security
- Cargo Security
- Cargo Inspection

(15)

## People Screening

- Biometrics
- Credentialing
- Hostile Intent
- Group Violent Intent Modeling

(10)

## Infrastructure Protection

- Analysis & Decision Support Systems
- Advanced Infrastructure Architecture & Systems Design
- Detection & Sensor Systems
- Response, Recovery and Reconstitution

(10)

## Incident Management

### Interoperability

- Advanced communication
- Digital voice communication
- Seamless data exchange

(14)

### Prep & Response

- First Responder Equipment
- Common Operating Picture & Situational Awareness
- Incident Modeling, Mapping & Simulation

(7)

## •The Capstone Execution Arm

- Detailed Customer Schedule and Requirements
- Detailed S&T Performance Parameters
- Coordinated Programmatic Alignment
- Codified Technology Transition Agreements

Red number indicates # of projects reviewed  
256 Total

**To Deliver Technology on Schedule with Requisite Performance**



# Rarely Seen Photo of a Capstone IPT Meeting



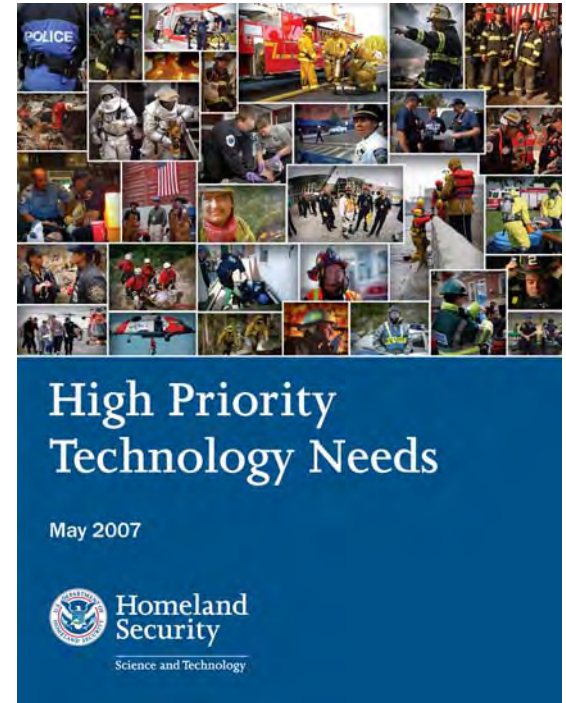
## *Integrated Product Team (IPT) Initial Outcome*

# High Priority Technology Needs

- 11 Capstone IPTs have identified 77 High Priority Technology Needs for DHS components and their customers
- Identified in brochure and posted at [www.hsarpabaa.com](http://www.hsarpabaa.com)
- Baseline established for conducting an iterative, dynamic IPT process on an annual cycle aligned with DHS funding and acquisition processes

### **IPT Next Steps:**

- Focus on delivering product to customers
- Detail proposed technology solutions
- Clarify deliverable and transition plans
- Develop Technology Transition Agreements to establish customer requirements and technical specifications



***Customer Focused...Output Oriented***

# Maritime Security IPT: Representative Technology Needs

- Wide-area surveillance from the coast to beyond the horizon; port and inland waterways region - detect, ID, and track
- Data fusion and automated tools for command center operations
- Vessel compliance through non-lethal compliance methods
- Enhanced capability to continuously track contraband on ships or containers
- Improved ballistic personal protective equipment for officer safety
- Improved WMD detection equipment for officer safety; improved screening capability for WMD for maritime security checkpoints



*S&T Lead Division: Border/Maritime*



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Security**

# Cargo Security IPT:

## Representative Technology Needs



- Enhanced screening and examination by non-intrusive inspection
- Increased information fusion, anomaly detection, Automatic Target Recognition capability
- Detect and identify WMD materials and contraband
- Capability to screen 100% of air cargo
- Test the feasibility of seal security; detection of intrusion
- Track domestic high-threat cargo
- Harden air cargo conveyances and containers
- Positive ID of cargo and detection of intrusion or unauthorized access

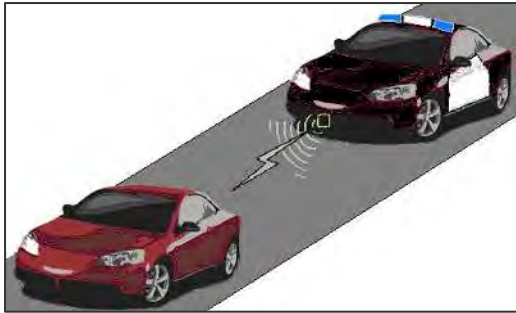
*S&T Lead Division: Border/Maritime*



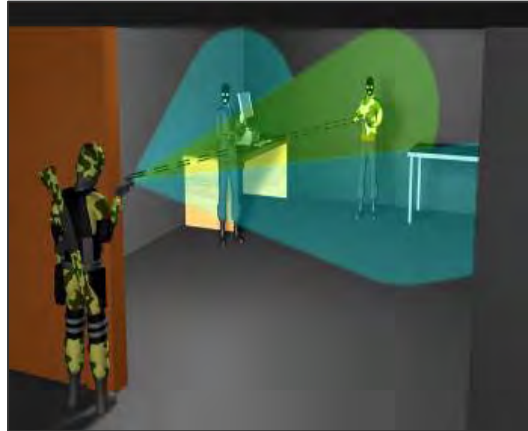
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# Border Officer Tools and Safety



**Microwave Vehicle Stopper**



**Light Emitting Diode  
Incapacitator**



**Officer Safety Load  
Carriage System**



**Integration of Mobile Biometrics**



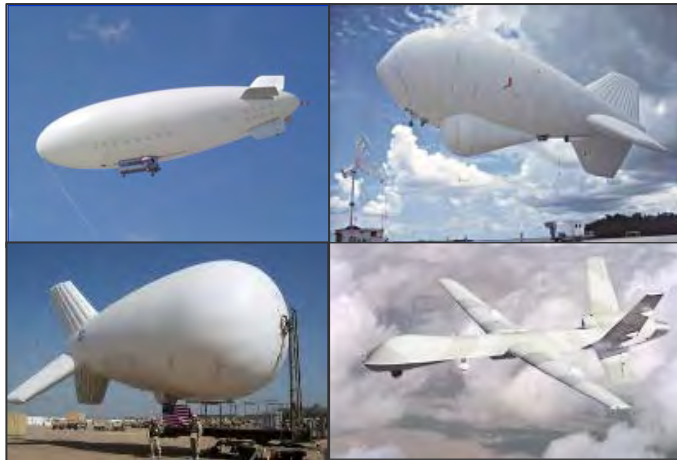
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# Maritime Security



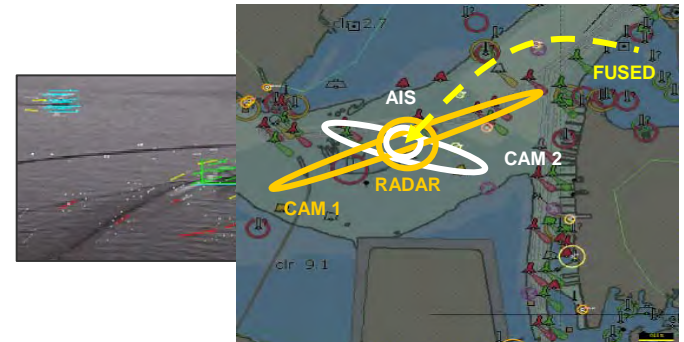
**Port and Coastal RADAR Improvement**



**Affordable Wide-Area Surveillance (WAS)**



**Vessel Stopping**



**Automated Scene Understanding**



**Boarding Team Communications**



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# Maritime Biometric Identification System:

## Handheld Biometric System Pilot in the Mona Pass

### Pilot Description

- Real-world operational pilot of Coast Guard maritime mobile biometrics technologies in the Mona Pass. The pilot will identify strengths and shortfalls associated with the use of mobile biometrics. The pilot will:
- assess feasibility and utility of ship-to-shore communications for the biometric device,
  - conduct operational testing and evaluation,
  - collect performance metrics, and
  - produce a technology development roadmap to guide procurement and acquisitions supporting Coast Guard operations.



### Planned Pilot/Deliverables/Transitions

- Conduct program coordination and requirements gathering – Q2 FY08 to Q1 FY09
- Participate in relevant working groups – Q2 FY08 to Q1 FY09
- Report on selection criteria for 2 additional handheld biometric collection devices for field testing – Q2 FY08
- Deliver system performance reports on fielded devices – Q2 FY08 to Q1 FY09
- Deliver hand quality study – Q1 FY09
- Deliver detailed transition plan – Q1 FY09

### S&T and Homeland Security Payoff

- Timely identification of interdicted immigrants to determine if they are on a watch or wanted list
- Results of pilot will inform S&T's FY09 Mobile Biometric transition project of specific real-world operational shortfalls that exist with the use of mobile biometrics devices
- Customer(s) – USCG with lessons learned for CBP, US-VISIT

	FY07	FY08	FY09	FY10	FY11	FY12	FY13	
Total Funding (\$K)	\$ 723	\$0	\$0	\$0	\$0	\$0	\$0	● Cost
Deliverables/Demos -	◆	◆◆◆◆						● Sched
Transitions / TRL -	▲							● Tech



Homeland  
Security

# Homeland Security Act of 2002

HSARPA will....

“Support basic and applied homeland Security research to promote *revolutionary* changes in technologies; advance the development, testing and evaluation, and deployment of critical homeland security technologies; and accelerate the prototyping and deployment of technologies that would address homeland security vulnerabilities.”

**EVERY  
TRULY  
GREAT  
ACCOMPLISHMENT  
IS AT FIRST  
IMPOSSIBLE!**

(FORTUNE COOKIE)



**Homeland  
Security**

# HIPS and HITS

**Homeland Innovative Prototypical Solutions (HIPS)** are designed to deliver *prototype-level demonstrations* of game-changing technologies in two to five years. Projects are moderate to high risk, with high payoff

**High Impact Technology Solutions (HITS)** are designed to provide *proof-of-concept* answers within one to three years that could result in high-payoff technology breakthroughs. While these projects are at considerable risk for failure, they offer the potential for significant gains in capability







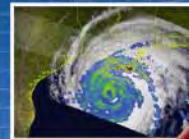
# Homeland Security

Science and Technology

Homeland Innovative Prototypical Solutions (HIPS)

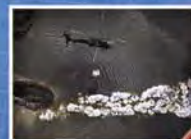
## HURRICANE & STORM SURGE MITIGATION

**FY08 4Q** – Storm surge mitigation system concept demonstration at the Army Corps of Engineers, Vicksburg, MS



## LEVEE STRENGTHENING

**FY08 4Q** – New survey methods demonstration using a variety of geophysical sensors on multiple platforms and address weak levees at the Army Corps of Engineers, Vicksburg, MS



## SENSIT

**FY08 4Q** – Liquid explosives field demonstration of a screening prototype for TSA 3-1-1 bags in a coin size tub at Los Alamos National Laboratory, NM



## REG

**FY08 2&4Q** – Laboratory demonstrations of fault limiting superconducting cable at Oak Ridge National Laboratory, TN



## FAST M2

**FY08 1Q** – Non-invasive sensor demonstration, validation and metrics at MIT Draper Laboratory



## CHLOE

**FY08 1Q** – Live-Fire Counter-Manpads Detection demonstration at White Sands Missile Range



## CRITICAL INFRASTRUCTURE CHANGE DETECTION

**FY08 1Q** – Examine technical characteristics of a new ultra high resolution optical sensor in lower Manhattan in coordination with the New York Police Department



## TUNNEL DETECT

**FY08 3Q** – Field experiments for improved airborne wide area surveillance system to increase the accuracy of detection



## RESILIENT TUNNEL

**FY08 3Q** – Trial prototype inflatable plug device at the West Virginia Memorial Tunnel



FY-08 Planned Demonstration Timeline

High Impact Technology Solutions (HITS)

Science & Technology  
Innovation Portfolio  
HSARPA



# SAFECON – Safe Container

Office of Innovation - Homeland Innovative Prototypical Solutions



# Counter-MANPADS/Persistent Surveillance

## Office of Innovation - Homeland Innovative Prototypical Solutions

### Project Chloe

#### Counter-MANPADS Functions

1. MWS Detect & Declare
2. Slew & Hand-off
3. Track
4. Jam

65K Feet

Border & Critical Infrastructure Surveillance

Engagement Time:  
3-10 Seconds

Maritime Surveillance &  
Interdiction



**MANPADS**

#### Unmanned Aircraft Systems (UASs)

- High-Altitude Stand-Off Counter-MANPADS
- High Altitude – Wide-Area Coverage
- Long Endurance – Persistent Surveillance
- Large Payload – Multi-Sensor

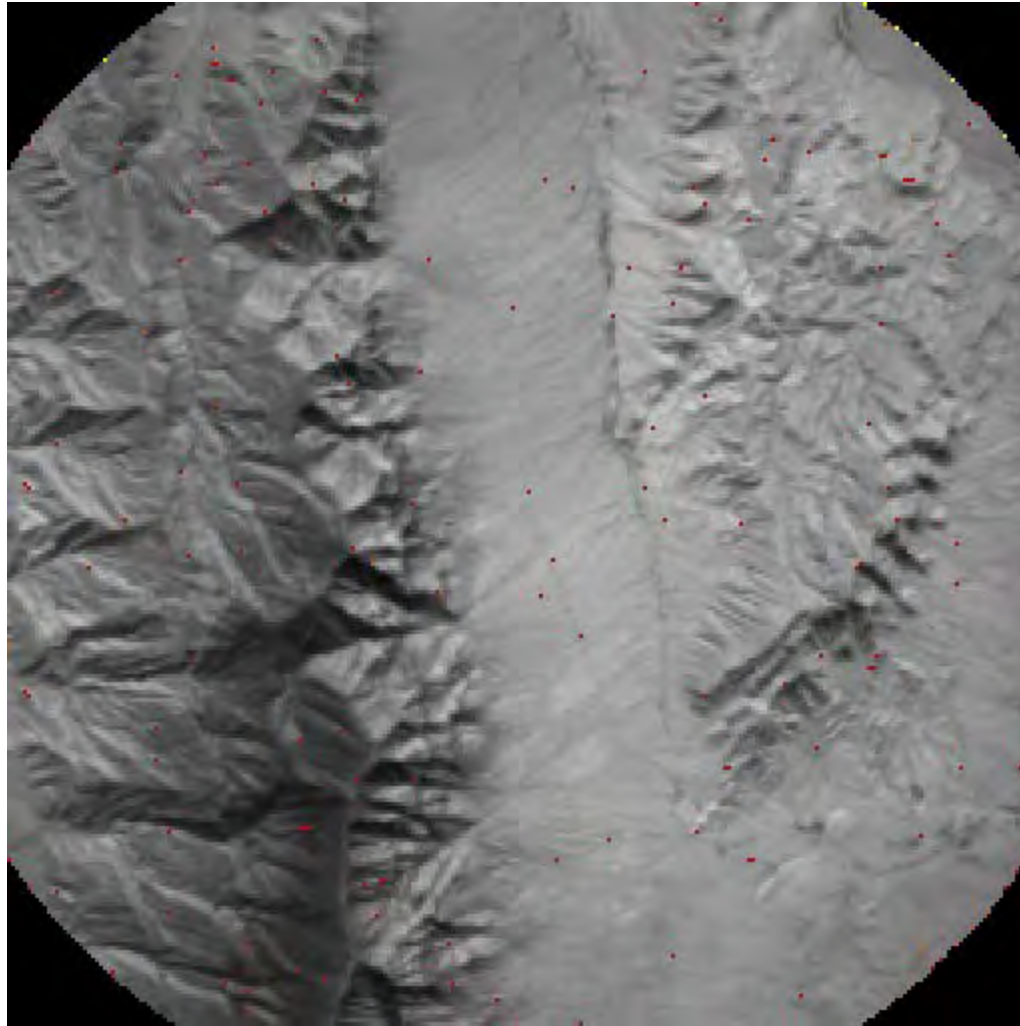
#### Operational Characteristics

- Real-time sensor fusion/dissemination
- Multi-user / border surveillance requirements
- Commercial Aircraft MANPADS protection
- Automatic target detection/recognition
- Persistence (24/7, all-weather coverage)



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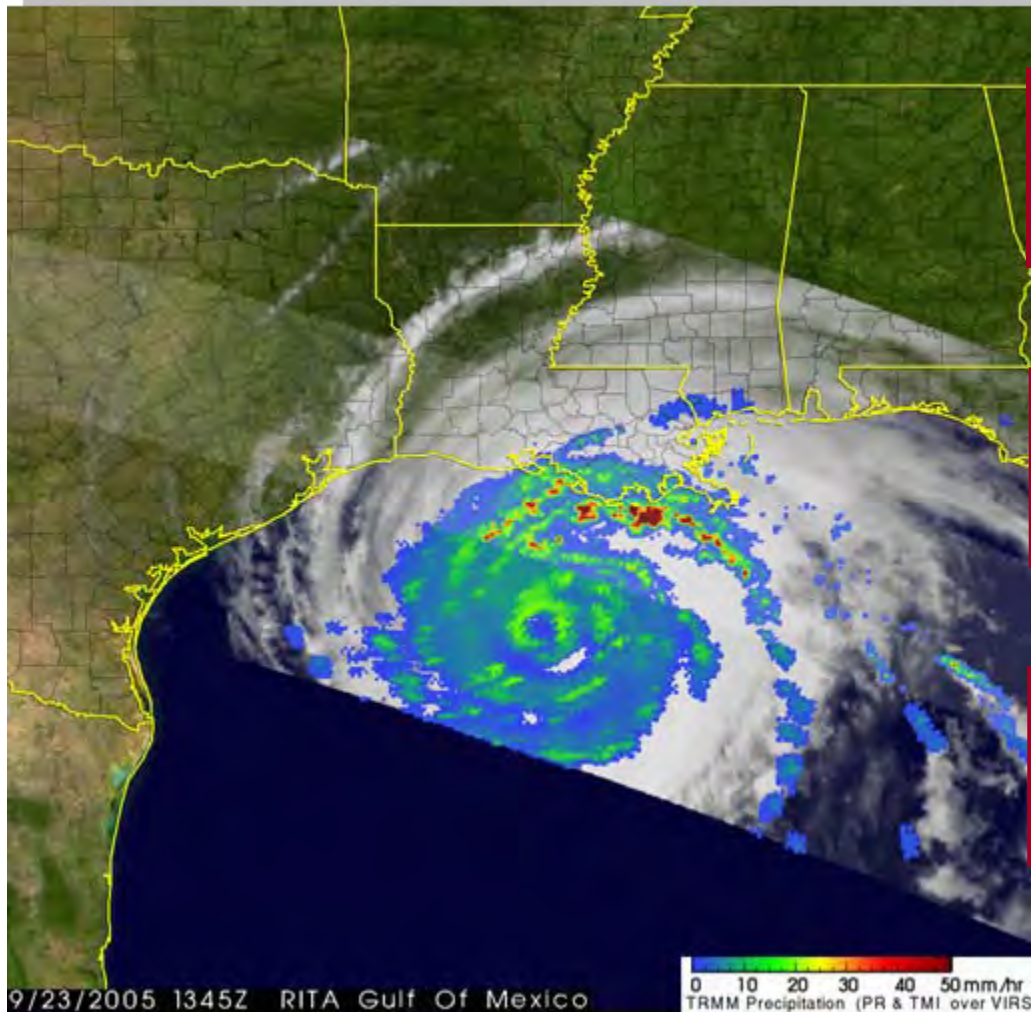
# Chloe: Live Fire Missile Testing



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# Homeland Innovative Prototypical Solutions Storm Surge Mitigation (SSM)



**Strategic use of underwater blasts to mitigate storm surge?**

**Use of drop-In structures to limit surge?**

**Rerouting of flood waters to limit damage to Critical infrastructure?**



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# Homeland Innovative Prototypical Solutions

## Levee Strengthening and Rapid Repair

**Pre-emptive mapping  
of weak levees**

**Pre-Flood Deployment of Protective  
And Rapid Repair Supplies to  
Problem Locations**

**Drop-in structures  
lofted by aircraft**



**Float-in structure guided  
by cables**



**Explosively Emplaced  
Support Structures**

**Roll-out protective  
coverings such as  
articulated concrete mats**



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# The Washington Post

Sept. 30-Oct. 3, 2007

## LEFT OF BOOM

THE STRUGGLE TO DEFEAT ROADSIDE BOMBS

'There was a two-year learning curve . . . and a lot of people died in those two years'



Spec. Luis Casas, right, an Army medic, tends to Pfc. Gonzales (l) shrapnel from an IED that exploded next to their Humvee during

## LEFT OF BOOM

THE STRUGGLE TO DEFEAT ROADSIDE BOMBS

'You can't armor your way out of this problem'

## LEFT OF BOOM

THE STRUGGLE TO DEFEAT ROADSIDE BOMBS

'The single most effective weapon against our deployed forces'

## LEFT OF BOOM

THE STRUGGLE TO DEFEAT ROADSIDE BOMBS

'If you don't go after the network, you're never going to stop these guys. Never.'

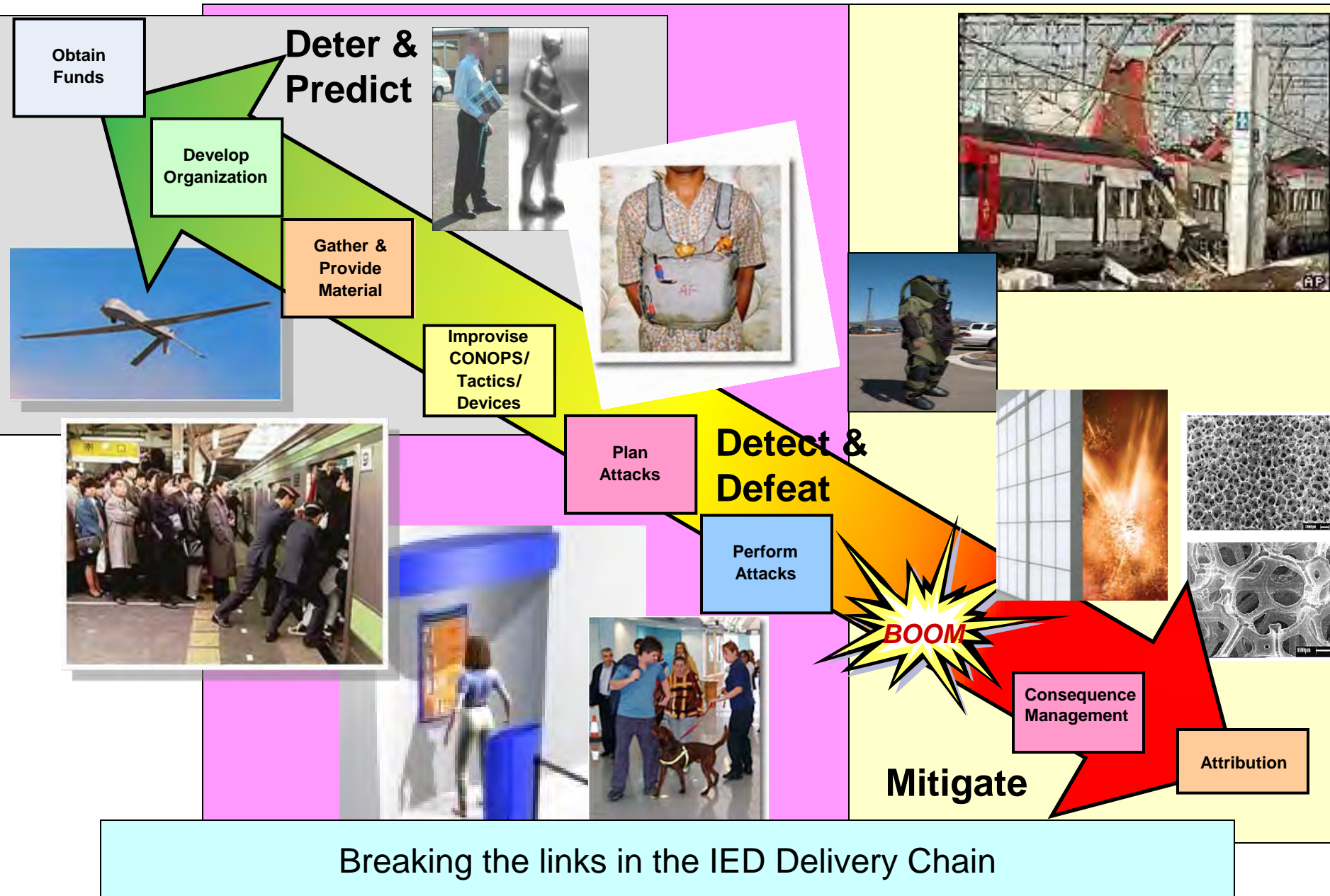




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# Countering the IED Threat

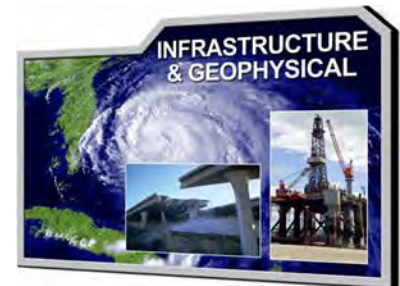


# Basic Research Portfolio

*Discovery and Invention to Enable Future Capabilities*



- Brings the capabilities, talent and resources of the Homeland Security Centers of Excellence, DOE National Laboratories and DHS Labs to bear to address the long-term R&D needs for DHS in sciences of enduring relevance
- This type of focused, protracted research investment has potential to lead to paradigm shifts in the nation's homeland security capabilities



# COE Alignment

## S&T DIVISIONS

Explosives

Chemical/Biological

Command,  
Control &  
Interoperability

Borders/Maritime

Human Factors

Infrastructure/  
Geophysical

**NEW**  
*National  
Center for  
Explosives  
Detection &  
Counter-  
measures*

NATIONAL CENTER FOR  
FOOD PROTECTION AND DEFENSE  
A HOMELAND SECURITY CENTER OF EXCELLENCE



*Consolidated  
Chem/Bio Center*

IDS-UACs

RVACs

*Consolidated  
CCI Center*

**NEW** *National  
Center for  
Border Security  
& Immigration*

**NEW** *National  
Center for  
Maritime Domain  
Awareness and  
Island &  
Remote/Extreme  
Environment*

**START** ➡



**NEW**  
*National  
Center for  
Gulf Coast  
Natural  
Disaster &  
Port Security*

Operations & Analysis

*Risk Sciences Branch & HSI Risk Determination*



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**CREATE**  
HOMELAND SECURITY CENTER

# DHS / DOE Laboratory Alignment

S&T DIVISIONS					
Explosives	Chemical/Biological	Command, Control & Interoperability	Borders/Maritime	Human Factors	Infrastructure/ Geophysical
LANL PNNL SNL NTS INL	LLNL SNL ANL LANL PNNL LBNL SRNL	LANL LLNL PNNL ORNL NTS INL LBNL	LLNL SRNL BNL	ANL BNL ORNL SNL	ORNL ANL INL BNL LBNL
	PIADC NBACC				
		NASA	NASA	NASA	



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**TSL / EML**



# DHS S&T Laboratories



Environmental  
Measurements  
Laboratory



National  
Biodefense  
Analysis and  
Countermeasures  
Center (NBACC)

Transportation Security Laboratory



Plum Island Animal Disease Center



... DHS S&T has four Labs and access to 10 DOE National Labs

# The New York Times

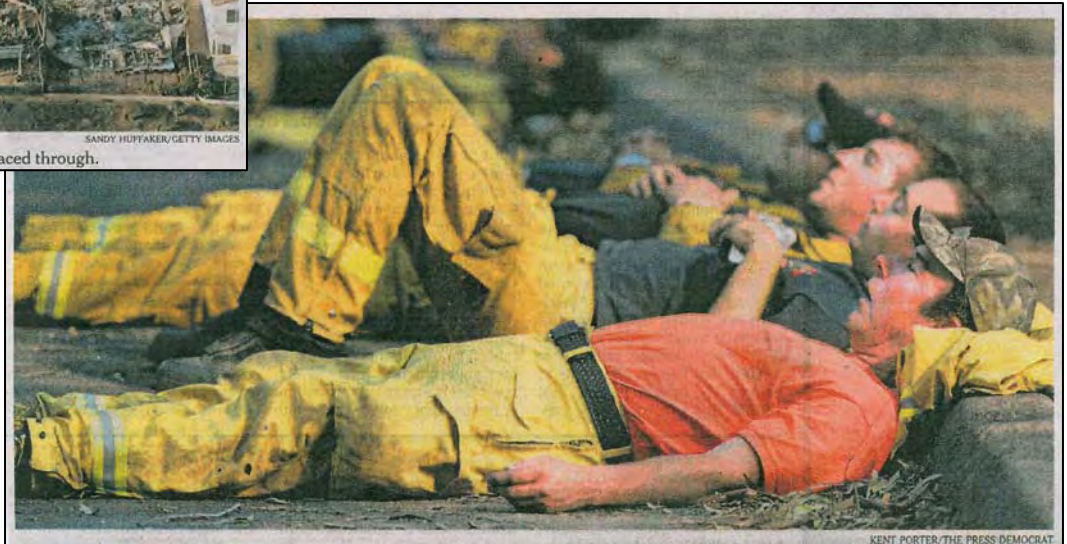
© 2007 The New York Times

THURSDAY, OCTOBER 25, 2007



SAN DIEGO A neighborhood in the Rancho Bernardo section was left in ruins yesterday after a fire raced through.

SANDY HUPTAKER/GETTY IMAGES



KENT PORTER/THE PRESS DEMOCRAT



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Security



# Project SAFE:

Enabling Technology to Protect Communities from Catastrophic Fires



# Doing Business with DHS S&T

## *Broad Agency Announcements*

### Current Solicitations

- Document validator
- Biometric detector
- Cyber Security R&D
- Unified Incident Command & Decision Support, Phase II
- RFI SAFE Container
- Home Made Explosives
- Emerging Counter-MANPADS Technologies Assessment

*For more about BAAs, visit [www.FedBizOpps.gov](http://www.FedBizOpps.gov) and [www.hsarpabaa.com](http://www.hsarpabaa.com)*



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# TECH-SOLUTIONS

- Mission: rapidly address technology gaps identified by Federal, State, Local, and Tribal first responders
- Field prototypical solutions in 12 months
- Cost commensurate with proposal but less than \$1M per project
- Solution should meet 80% of identified requirements
- Provide a web-based mechanism for Emergency Responders to relay their capability gaps ([www.dhs.gov/techsolutions](http://www.dhs.gov/techsolutions))
- Gaps addressed with existing technology, spiral development, rapid prototyping
- Emergency Responders partner with DHS from start to finish

*Rapid Technology Development*  
**Target: Solutions Fielded within 1 year, at ~<\$1M**

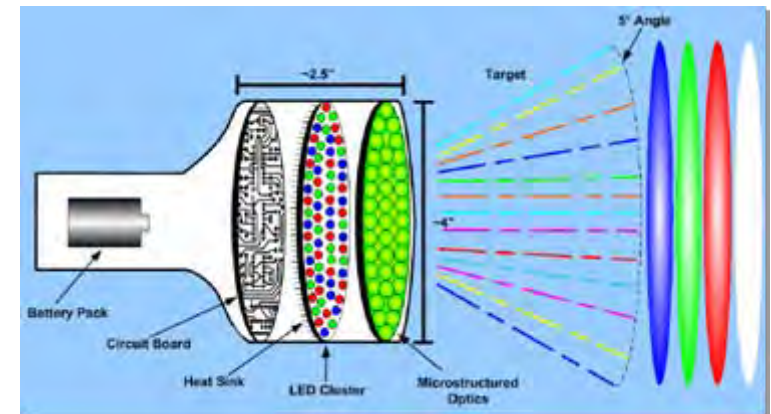


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# *From “Don’t TAZE me” to...”DAZE me.”*

## *LED Incapacitator: “The Dazzler”*

- Light-emitting diode tool provides non-lethal means of subduing people who pose a security threat at ports of entry and other locations
- Emits colorful, ultra-bright pulsing light that disorients and temporarily blinds subjects with reactions that range from vertigo to nausea
- Customers and End Users: Border Patrol, Federal Protective Services, FAMs, USCG, ICE, State and local law enforcement, etc.
- Testing underway at Penn State
- A joint project of SBIR and Border/Maritime Security Division



# DHS S&T Stakeholders Conferences

- International Security and National Resilience (ISNR) conference, London, December 3-5, 2007. Visit [www.isnrlondon.com](http://www.isnrlondon.com)
- S&T Stakeholders Conference West with first responder focus, Los Angeles, January 14-17, 2008
- Stakeholders Conference, Washington, DC, May 2008



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# DHS S&T Innovation in the News...



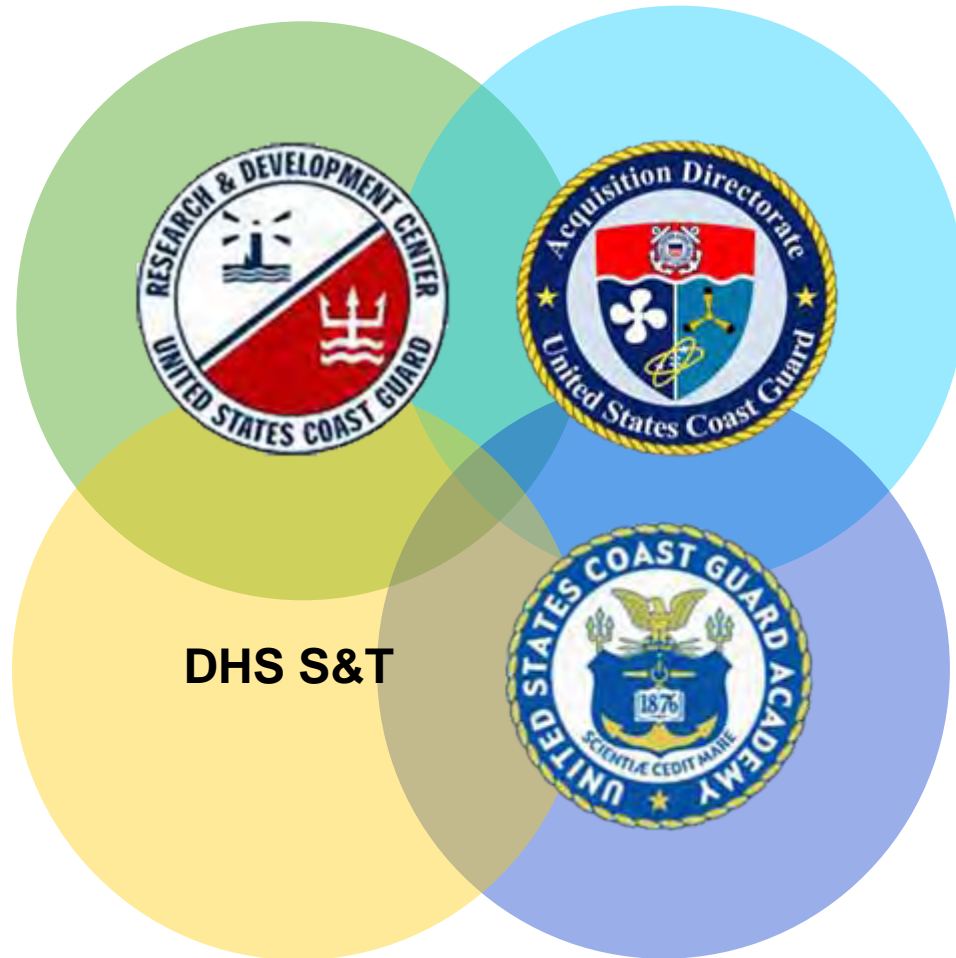


# New brown-water Navy?



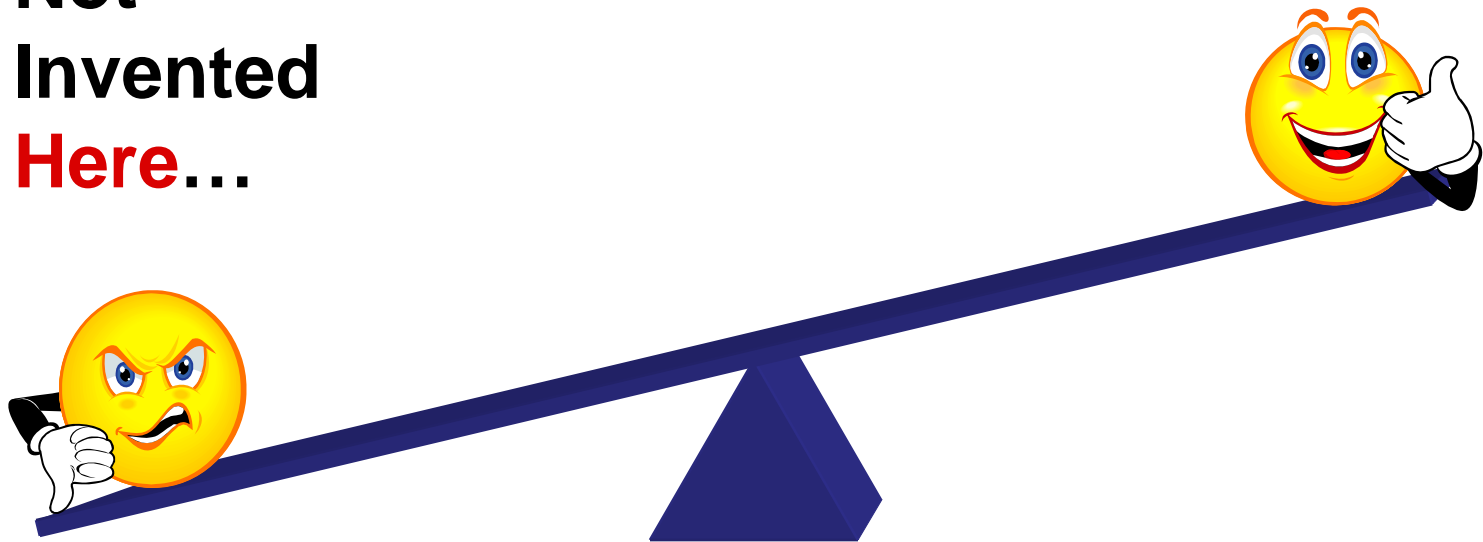
MC1 GEORGE LABIDOU/NAVY

**"The competition between Littoral Combat Ship designs continues."**



***FROM***  
**Not**  
**Invented**  
**Here...**

**...TO Not Invented **YET****







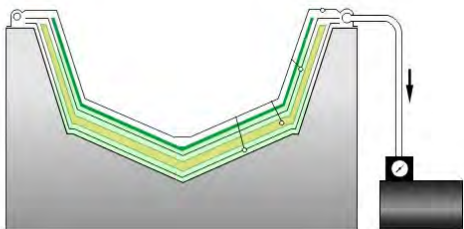




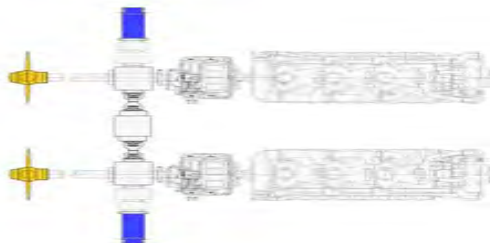
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Security

# Future Patrol Boat Technologies

## Composite Materials



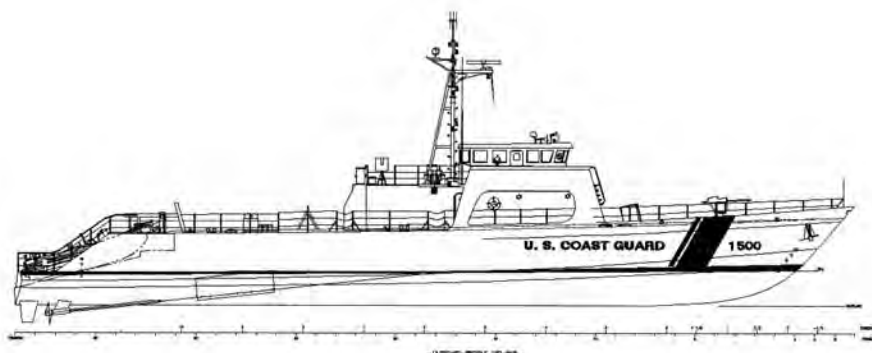
## Hybrid Propulsion



## Lifting Bodies



## Scalable Composite Vessel Prototype



- Increased Efficiency
- Reduced Maintenance
- Extended Service Life
- Increased Effectiveness



Homeland  
Security

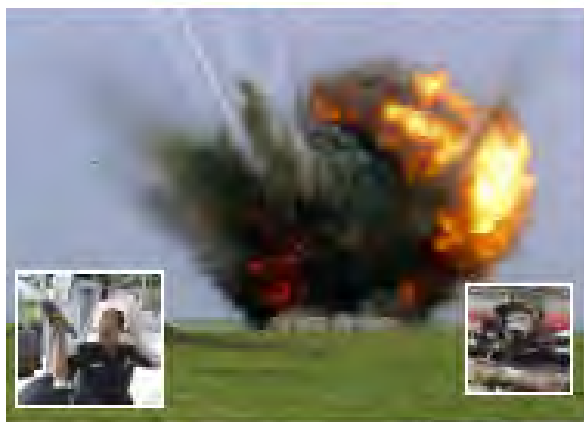




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**FROM SCIENCE...SECURITY**

**Explosives**



**Chemical/Biological**



**Command, Control, &  
Interoperability**



**Borders/Maritime**



**Human Factors**



**Infrastructure/Geophysical**



**FROM TECHNOLOGY...TRUST**



# Back-Up Slides



**Homeland  
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# DEEPWATER



# Product Transition Portfolio

*Enabling Capabilities, Supporting Mission Critical Needs of DHS*



## Integrated Product Teams (IPTs)

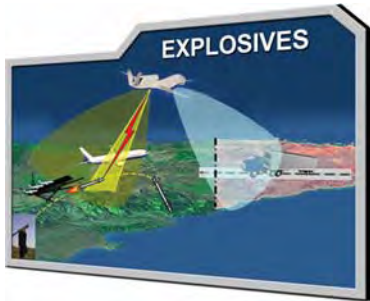
- 11 Capstone IPTs form the centerpiece of the S&T's customer-driven approach to product transition
- Engage DHS customers, acquisition partners, S&T technical division heads, and end users in product research, development, transition and acquisition activities
- Identify our customers' needs and enable and transition near-term capabilities for addressing them





# Innovation Portfolio

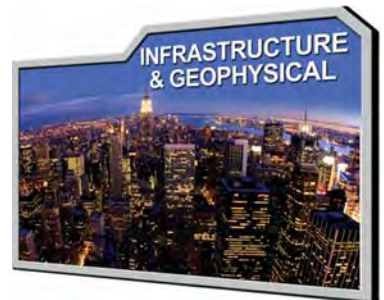
*High Risk, High Gain, Game Changers for Leap-Ahead Results*



- Promotes revolutionary changes in technology
- Focus on prototyping and deploying critical technologies

Includes:

- HSARPA – Homeland Security Advanced Research Projects Agency
- “Homeworks” – 1% of budget highest risk, highest pay-off
- Small Business Innovation Research program
- Visit [www.FedBizOpps.gov](http://www.FedBizOpps.gov), [www.hsarpabaa.com](http://www.hsarpabaa.com) and [www.sbir.dhs.gov](http://www.sbir.dhs.gov)





*Are You  
Suffering from  
Not Invented  
Yet Syndrome?*



# Hurricane and Storm Surge Mitigation



## Research Program Objectives:

- Produce methods that minimize the damage potential and threat to human safety associated with storm surge and wave events
- Provide guidance on and demonstrate surge and wave attenuation techniques on both the regional and local scale
- Develop improved tools and application approaches that enable better disaster preparedness, planning, and risk management.



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# Hurricane and Storm Surge Mitigation



Surge and wave reduction at the regional scale using natural landscape features to reduce and redistribute surge. Develop guidance on:

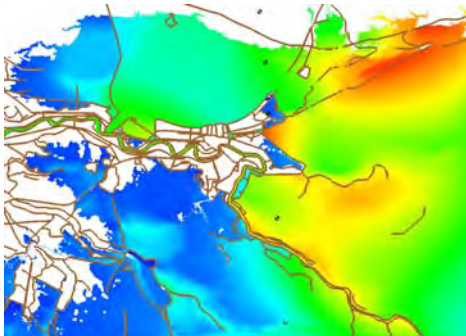
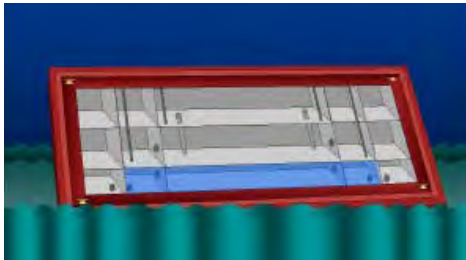
- Landscape planning and utilizing engineered structures in combination with wetlands, barrier islands, lakes and other natural features for maximum surge and wave reduction benefit.
- Vegetation cover with greatest surge reduction potential and assess survivability of various types to determine possible range of application



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# Hurricane and Storm Surge Mitigation



Surge and wave interdiction at the local scale using innovative engineered structures placed in a strategic location (i.e. navigation channel, river, or other natural constriction) to reduce storm surge from entering vulnerable areas.

- Inflatable of water filled schemes for rapid deployment

Reduce risk through improved tools and applications that enable better disaster preparedness, planning, and risk management

- Advance numerical modeling capabilities to predict surge, waves, flooding
- Surge interdiction decision support system



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# Plumbing the ocean depths for approaches to mitigating the impacts of hurricanes...

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Last Updated: Wednesday, 26 September 2007, 17:01 GMT 18:01 UK

E-mail this to a friend Printable version

## Lovelock urges ocean climate fix

By Richard Black  
Environment correspondent, BBC News website

Two of Britain's leading environmental thinkers say it is time to develop a quick technical fix for climate change.

Writing in the journal Nature, Science Museum head Sir John Rogers, and Gaia theory proponent James Lovelock are looking at boosting take-up of CO<sub>2</sub>.

Their idea, already huge flotillas of vessels.

The two scientists curbing carbon emissions.

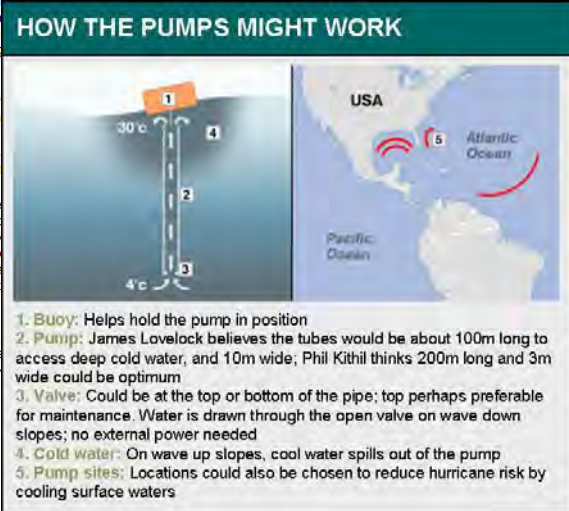
"We are taking the line that we are not saving the planet by approaches like the Protocol or renewable energy," says Professor Lovelock.

"What we have to do is to change our Gaian sense, and...

**VIDEO AND AUDIO NEWS**  
Animation of ideas aiming to cut global pollution

**CLIMATE CHANGE**  
Animated guide find out how the greenhouse effect works and more...

**GLOBAL POLITICS**



## Telegraph.co.uk

### James Lovelock's plan to pump ocean water to stop climate change

By Roger Highfield, Science Editor  
Last Updated: 6:01pm BST 26/09/2007

Have your say Read comments

A plan to save our world from extreme climate change by pumping cold water from depths of the oceans is outlined today by James Lovelock, the scientist.

James Lovelock is best known for his idea of the Gaia hypothesis, which sees the Earth as a living organism - named Gaia - that portrays Earth as a living goddess - in which the land and water interact in the environment remain.

Today Lovelock, of Green College, University, outlines an idea to stimulate the Earth to cool itself. He says the idea is to pump cold water from the depths of the ocean to the surface, a former head of the British Antarctic Survey who is now the director of the Science Museum, London.

They believe the answer lies in the oceans, which transport much more heat around the planet than the atmosphere and, covering more than 70 per cent of the Earth's surface.

They propose that vertical pipes, several metres across, be placed in the ocean that wave motion would pump up water from 100-200 metres depth to the surface, moving nutrient-rich waters in the process, mix with the relatively barren water at the ocean surface.

This would fertilise algae in the surface waters and encourage them to bloom, absorbing carbon dioxide greenhouse gas from the atmosphere. Sulphide that is known to seed sunlight.

### N.J. scientists eye method for reducing hurricane power



By Mike Derer, AP

Professor Alan F. Blumberg of Stevens Institute of Technology, stands in the under-renovation research wave pool on the campus in Hoboken, N.J., Tuesday. Blumberg, along with Princeton University Professor George L. Mellor, are investigating whether hurricanes can be modified by using millions of portable water pumps to bring cooler water to the surface of the ocean, thereby reducing the severity of the hurricane.



**Homeland Security**

# Future Attribute Screening Technology Mobile Module (FAST M2)

## Office of Innovation - Homeland Innovative Prototypical Solutions



### Systems

- Queue management
- Behavioral profiling
- Rapid risk assessment
- Screening methodologies

### Operational Characteristics

- Discover screening methods for intent
- Privacy protection for all participants
- Simple to operate and use

### Functions

- Identity verification
- Attribute measurement
- Risk determination
- Behavior focused screening



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# Scalable Composite Vessel Prototype (SCVP)

## Project Description:

~150' Scalable Composite Vessel Prototype  
 30+kts                      Stern Launched 7m RHIB  
 25mm Gun                5+ day endurance

Advanced Composite Construction

## Goals:

- Mitigate production risk of monolithic adv. composite hull
- Develop and certify production procedures / cost data
- Demonstrate emerging stability/propulsion technologies
- Optimization of stern launch and recovery design
- Potential for immediate transition into FRC production line



## Technical Information and Challenges:

Advanced composite production process overcomes many of the past drawbacks of composite ship construction (inconsistent material properties, high material waste, long production time, environmental hazards) but, advanced process has yet to be developed/demonstrated on this scale.

## Provider:


Competitive BAA

## Payoff:

- Strength/Weight/Durability: Extremely high strength to weight ratio. Advanced process provides consistent material properties and high durability.
- Reduced Life-cycle Costs: No corrosion. Reduced cost/manpower for dry-docking and preservation.
- Reduced Production Cost: Re-usable mold accelerates series production and could yield reduced unit cost.

## Intended Customer for transition:

US Coast Guard

		FY08	FY09	FY10
Funding (\$M)	DHS (S&T)	\$8	\$8	\$0
	USCG	\$8	\$8	\$0
Deliverables/Demos -				



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20-36 Planes - 1<sup>st</sup> Del- 2008



Maritime Patrol Aircraft (MPA)  
CASA 235-300M  
(Under Contract)



High Altitude  
Endurance Unmanned  
Air Vehicle (UAV)  
4 UAVs- 1<sup>st</sup> Del 2016



Long-Range Surveillance  
Aircraft (HC-130)

22 Planes - 1<sup>st</sup> Del- 2008



HH-60 "Jayhawk" Medium Range  
Recovery Helicopter  
42 Helos - 1<sup>st</sup> Del- 2009



Multi-Mission Cutter Helicopter (MCH)  
(Under Contract)  
95 Helos - 1<sup>st</sup> Del- 2008



MH-68A HITRON  
Armed Interdiction Helicopter  
(Under Contract)  
8 Helos - 1<sup>st</sup> Lease- 2003

25 Cutters  
1<sup>st</sup>  
Del- 2010



6-8 Cutters 1<sup>st</sup> Del- 2007

National Security Cutter (NSC)  
(Under Contract)



Offshore Patrol Cutter (OPC)  
(Under Contract)



HV-911 Eagle Eye Tiltrotor VUAV  
(Vertical Take-off and Landing Unmanned Aerial Vehicle)  
(Under Contract)

45-69 VUAVs - 1<sup>st</sup> Del 2007



31-33 Boats 1<sup>st</sup> Del-2007

Long-Range  
Interceptor (LRI)  
(Under Contract)



74-91 Boats 1<sup>st</sup> Del- 2004

Short Range  
Prosecutor (SRP)  
(Under Contract)



8 Boats  
1<sup>st</sup> Del- 2004

123' Patrol Boat (WPB)  
Modernization  
(Under Contract)



Fast Response Cutter (FRC)  
(Under Contract)

43-58 Cutters  
1<sup>st</sup> Del- 2007

INTEGRATED COAST GUARD SYSTEMS  
**DEEPWATER**



The diagram illustrates a networked sensor system for border security, showing the flow of information between various components across a desert landscape. The system is divided into two main regions: the United States (top) and Mexico (bottom), separated by a dashed line representing the border.

- United States (Top):**
  - Communications Sensors:** Located in the upper left, connected to the Station/Sector Command Center.
  - Station/Sector Command Center:** A large building with multiple computer monitors and a control room, connected to the Communications Sensors and the Wireless Communications network.
  - Radar/EO/IR Sensors:** A tall tower with a rotating sensor platform, connected to the Wireless Communications network.
- Mexico (Bottom):**
  - Unattended Ground Sensors:** Several small, ground-based sensors connected to the Wireless Communications network.
  - Wireless Communications:** A central hub represented by a network of orange lines connecting all sensors and the command center.
  - Data Query/Situational Awareness:** A person standing next to a vehicle, connected to the Wireless Communications network.

The diagram uses red lightning bolt symbols to represent the communication links between the various sensors and the central command center. The background shows a desert landscape with mountains in the distance.



A person is seated at a desk, viewed from the side, operating a multi-monitor system. The setup includes a large central monitor at the top displaying a software interface with a map and various data panels. Below it are three smaller monitors: the left one shows a satellite image, the middle one shows a map with overlaid data, and the right one shows a landscape image. A laptop is open on the desk to the right of the middle monitor. The person is wearing a headset and a dark shirt. The background is a plain blue wall.

[illegible]

## Secure Border Initiative (SBI) Systems Engineering and Modeling & Simulation

USCG Innovation Expo

Innovations in Government Panel

# **DHS Science and Technology Innovation Portfolio Overview**

Rolf Dietrich

Deputy Director of Innovation/HSARPA

Director of Homeworks

Science and Technology Directorate



Homeland  
Security

# DHS S&T Investment Portfolio

Balance of Risk, Cost, Impact, and Time to Delivery

<b>Product Transition (0-3 yrs)</b> <ul style="list-style-type: none"><li>▪ Focused on delivering near-term products/enhancements to acquisition</li><li>▪ Customer IPT controlled</li><li>▪ Cost, schedule, capability metrics</li></ul>	<b>Innovative Capabilities (1-5 yrs)</b> <ul style="list-style-type: none"><li>▪ High-risk/High payoff</li><li>▪ “Game changer/Leap ahead”</li><li>▪ Prototype, Test and Deploy</li><li>▪ HSARPA</li></ul>
<b>Basic Research (&gt;8 yrs)</b> <ul style="list-style-type: none"><li>▪ Enables future paradigm changes</li><li>▪ University fundamental research</li><li>▪ Gov’t lab discovery and invention</li></ul>	<b>Other (0-8+ yrs)</b> <ul style="list-style-type: none"><li>▪ Test &amp; Evaluation and Standards</li><li>▪ Laboratory Operations &amp; Construction</li><li>▪ Required by Administration (HSPDs)</li><li>▪ Congressional direction/law</li></ul>

**Customer Focused, Output Oriented**



Homeland  
Security

# Homeland Security Act of 2002

HSARPA shall....

“Support basic and applied homeland Security research to promote *revolutionary* changes in technologies; advance the development, testing and evaluation, and deployment of critical homeland security technologies; and accelerate the prototyping and deployment of technologies that would address homeland security vulnerabilities”

**EVERY  
TRULY  
GREAT  
ACCOMPLISHMENT  
IS AT FIRST  
IMPOSSIBLE!**

(FORTUNE COOKIE)



Homeland  
Security



# HIPS and HITS

Homeland Innovative Prototypical Solutions (HIPS), which are designed to deliver prototype-level demonstrations of game-changing technologies in two to five years. These projects are moderate to high risk, with high payoff

High Impact Technology Solutions (HITS), which are designed to provide proof-of-concept answers within one to three years that could result in high-payoff technology breakthroughs. These projects have considerable risk of failure, however they also offer the potential for significant gains in capability

# Homeland Innovative Prototypical Solutions (HIPS)

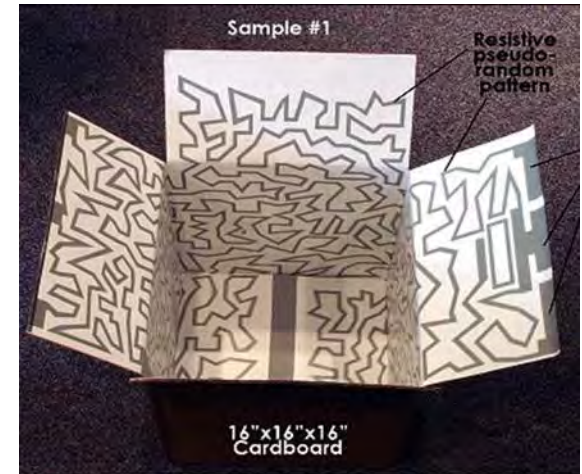
Explosives	Chem/Bio	Command, Control & Interoperability	Borders/ Maritime	Human Factors	Infrastructure/ Geophysical
<p><b>Project Chloe-</b> High altitude aerial platform existing above civil aviation Counter-MANPADS</p> <p><b>SENSIT –</b> System to identify numerous liquids in baggage</p> <p><b>IED Defeat / APE VBIED Defeat –</b> Detection/prevention and mitigation technologies to counter IEDs</p>		<p><b>SCOPE</b> (Scalable Common Operational Picture Experiment) – Leverages Global Observer JCTD</p>	<p><b>Scalable Composite Vessel Prototype (SCVP) –</b> Lightweight, composite material with high speed hull</p> <p><b>SAFECON –</b> 90 second container screening device</p>	<p><b>FAST M2</b> (Future Attribute Screening Technology Mobile Module) – Relocatable Lab capable of testing for behavioral/ physiological cues of “hostile intent”</p> <p>Double or triple wide trailer tested at various sites around the country</p>	<p><b>Resilient Electric Grid –</b> System that will prevent cascading effects of power surge on electrical grids</p> <p><b>Levee Strengthening and Rapid Repair</b> - rapidly stop a breach in a levee</p> <p><b>Storm Surge and Hurricane Mitigation</b></p>

## High Impact Technology Solutions (HITS)

	<p><b>Real Time Bio Detection and Identify</b></p> <p><b>Cell-All -</b> Ubiquitous Chem/Bio/agent detector</p>	<p><b>First Net -</b> First Responder Reliable Relay Link</p> <p><b>Phone Home –</b> Inter-operative and inexpensive hand-held radios</p>	<p><b>Tunnel Detect –</b> Ability to detect, identify, and confirm illegal and clandestine underground border structures and activities</p>	<p><b>Document Validator –</b>High proficiency scanner that can identify fraudulent docs Leverage USSS system</p> <p><b>Biometric Detector –</b> High proficiency small biometric scanner</p>	<p><b>Wide Area Surveillance/ Change Detection for Critical Infrastructure</b></p> <p><b>Resilient Tunnel–</b> Tunnel Protection/Blast Mitigation</p>
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# DHS SBIR Program

- Increases participation of innovative and creative small businesses in Federal research and development programs
- Challenges small businesses to bring innovative homeland security solutions to reality
- Focuses on near-term commercialization and delivery of operational prototypes
- Over 324 contracts awarded
- Funded by S&T Directorate and DNDO
- Implemented Cost Match to motivate commercialization





**[www.hsarpabaa.com](http://www.hsarpabaa.com)**

For S&T Broad Agency Announcements and more

**[www.sbir.dhs.gov](http://www.sbir.dhs.gov)**

For SBIR solicitation information

**[FedBizOpps.gov](http://FedBizOpps.gov)**

Federal Business Opportunities

**[S&T-Innovation@dhs.gov](mailto:S&T-Innovation@dhs.gov)**

To contact S&T innovation







Homeland  
Security



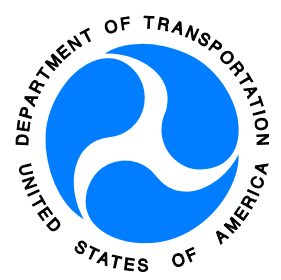
# Sharing AIS Data

## *Maritime Administration Efforts*

Owen Doherty

Director, Office of Security



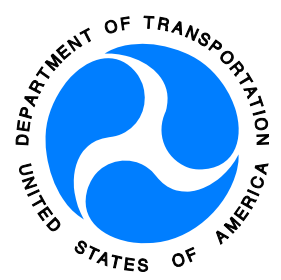


# Reasons to Share AIS

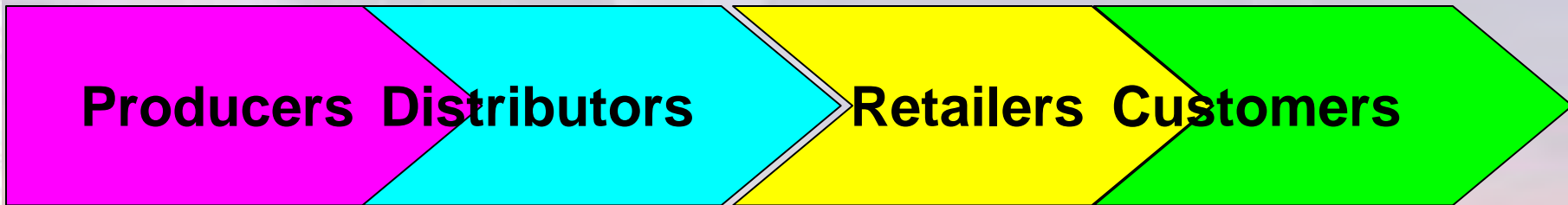


- **Safety**
- **Security**
- **Environment**
- **Commercial Mobility**
- **National Security**



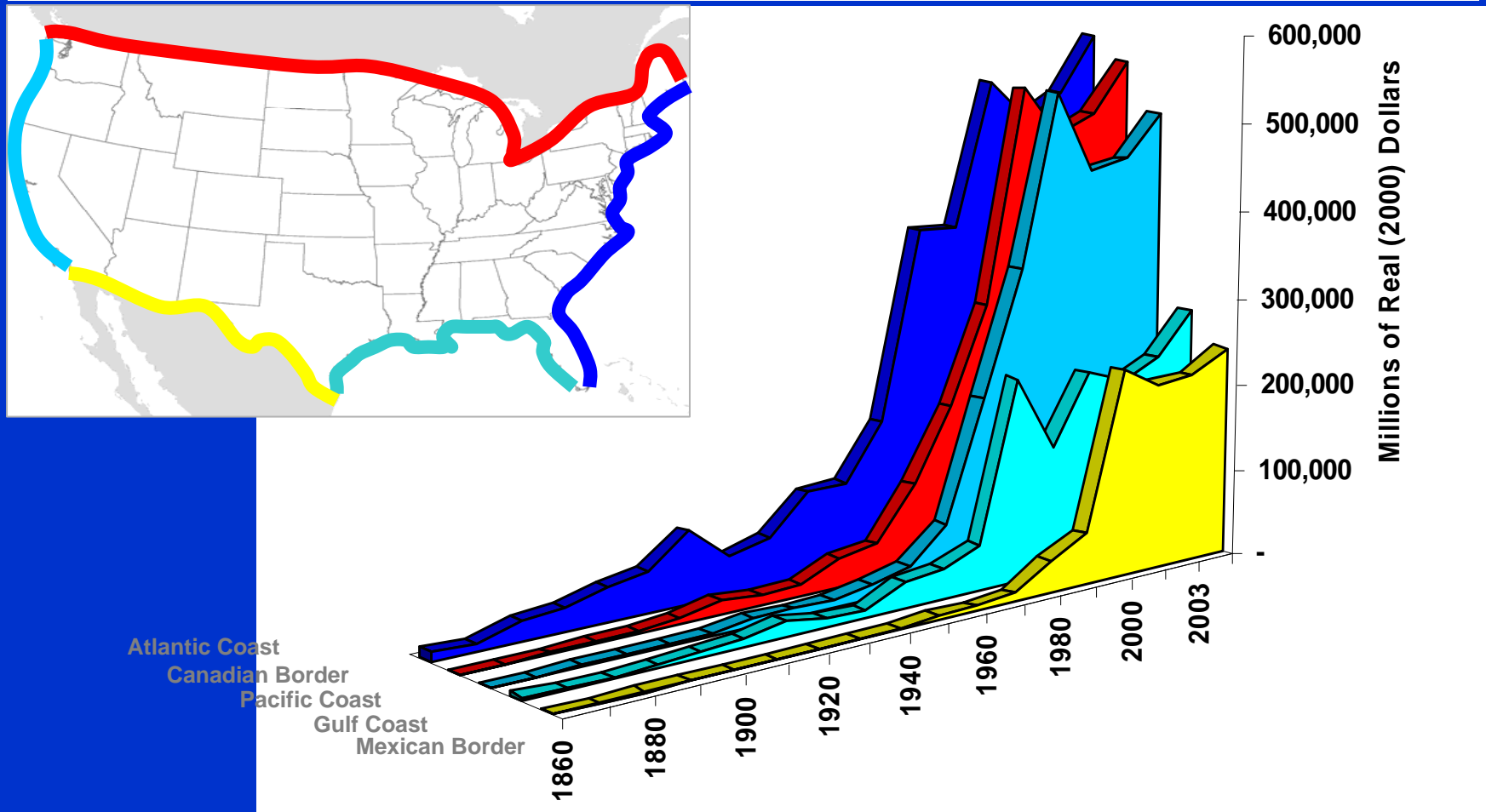


# Global Supply Chain Components



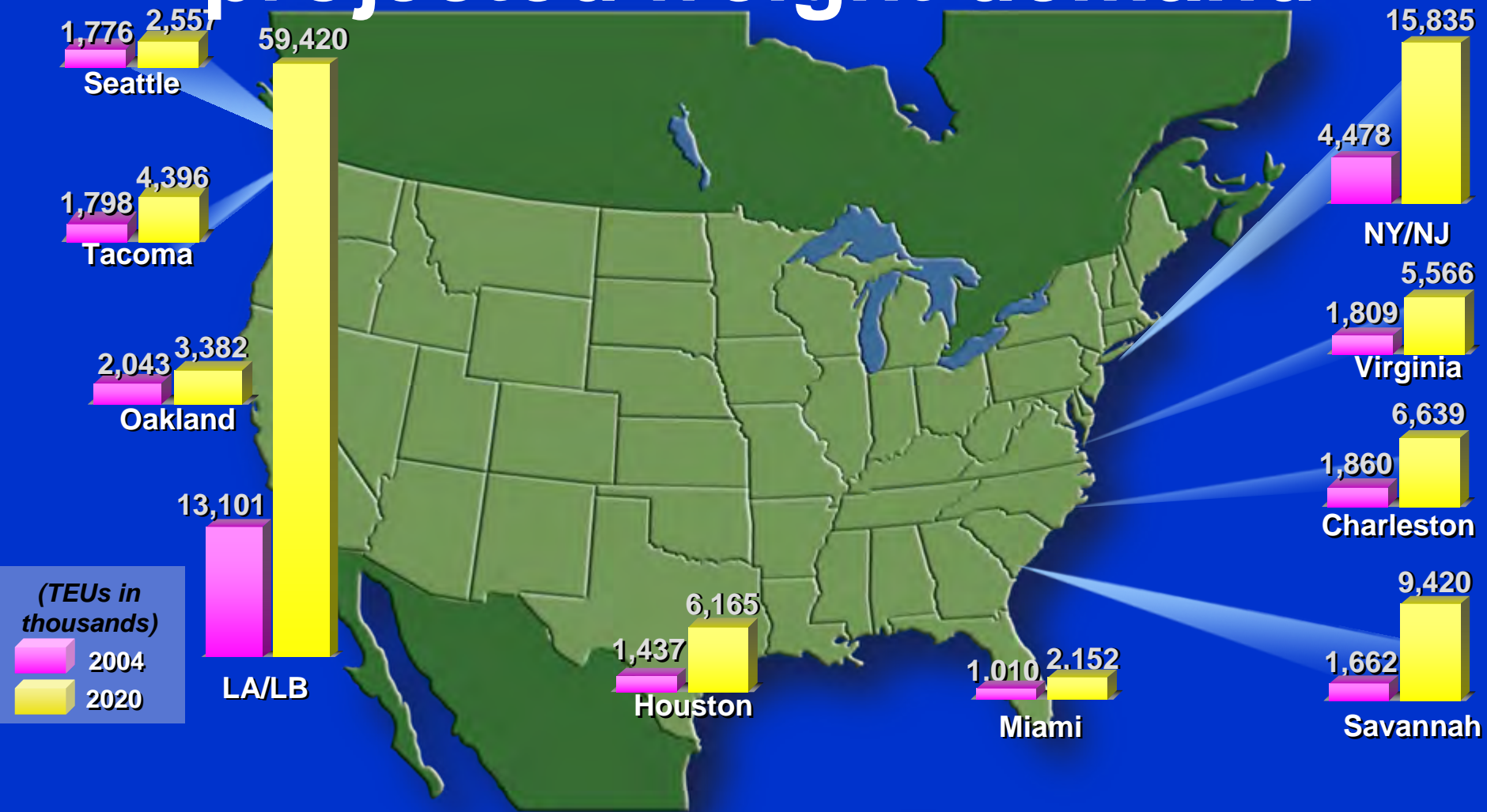


# Trade Growth, 1860 to 2005



*The value of U.S. trade—measured in constant dollars by coast and land border—has grown rapidly over the last 30 years*

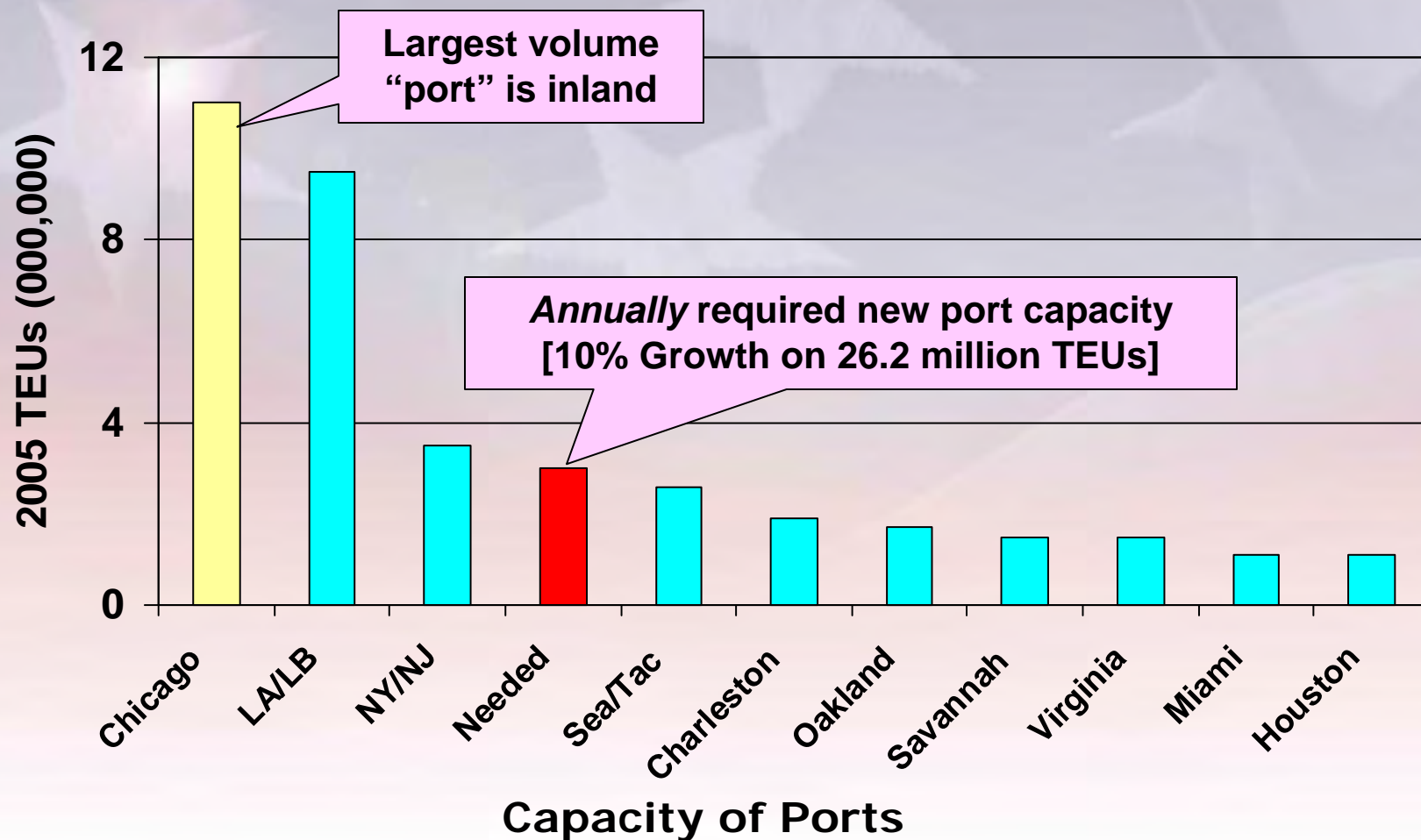
# Dramatic increases in projected freight demand

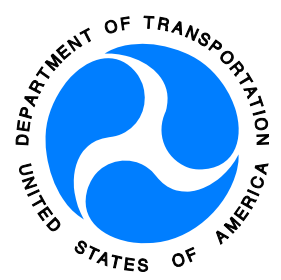


\* Forecast figures are based on an unconstrained 10-year linear regression, and do not reflect the expected capacity of each port in 2020.



# Impact of Global Trade on Major Ports of the United States





# Supply Chain Security and Productivity



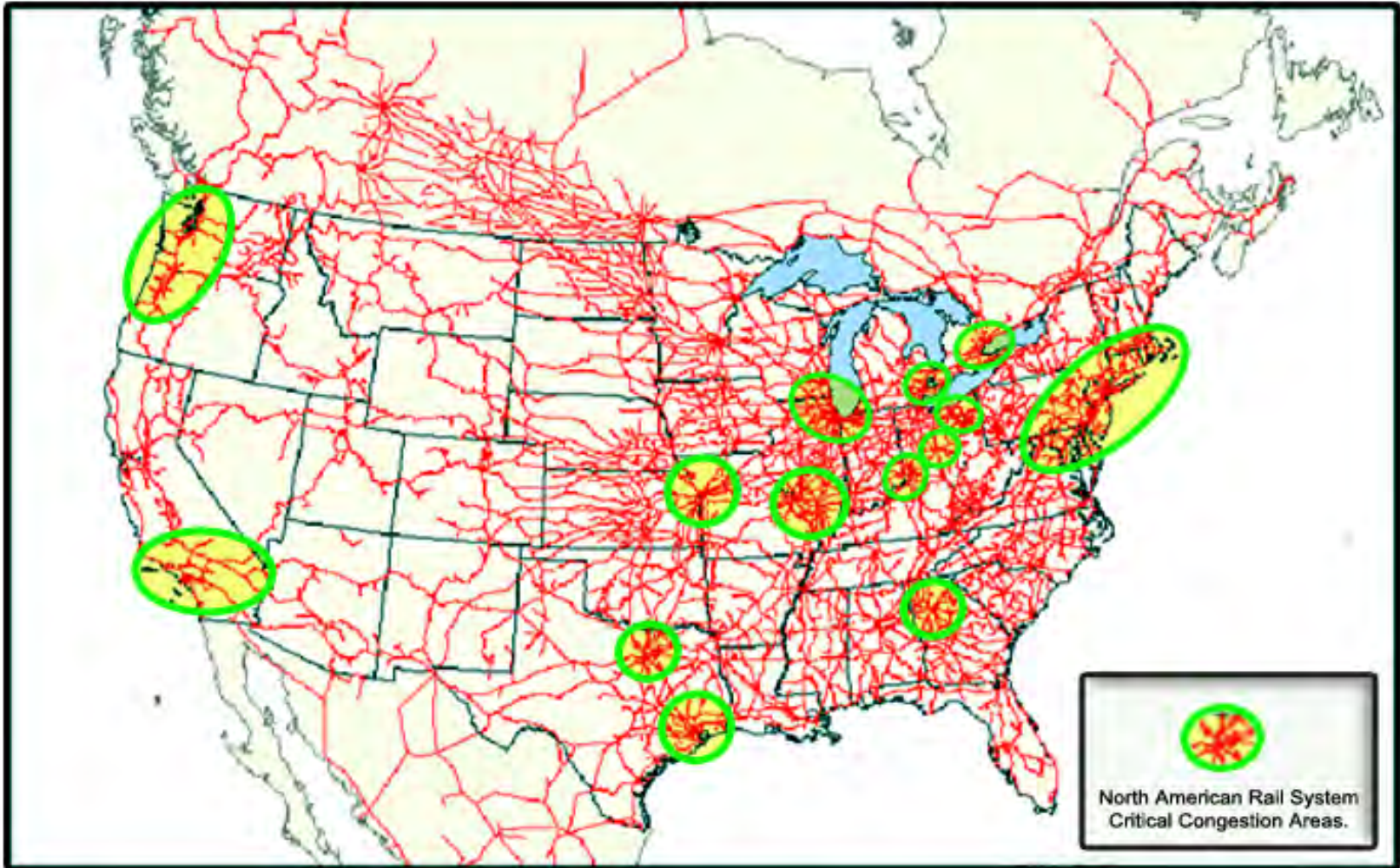
- Integrated System
- Transparency
- Accountability





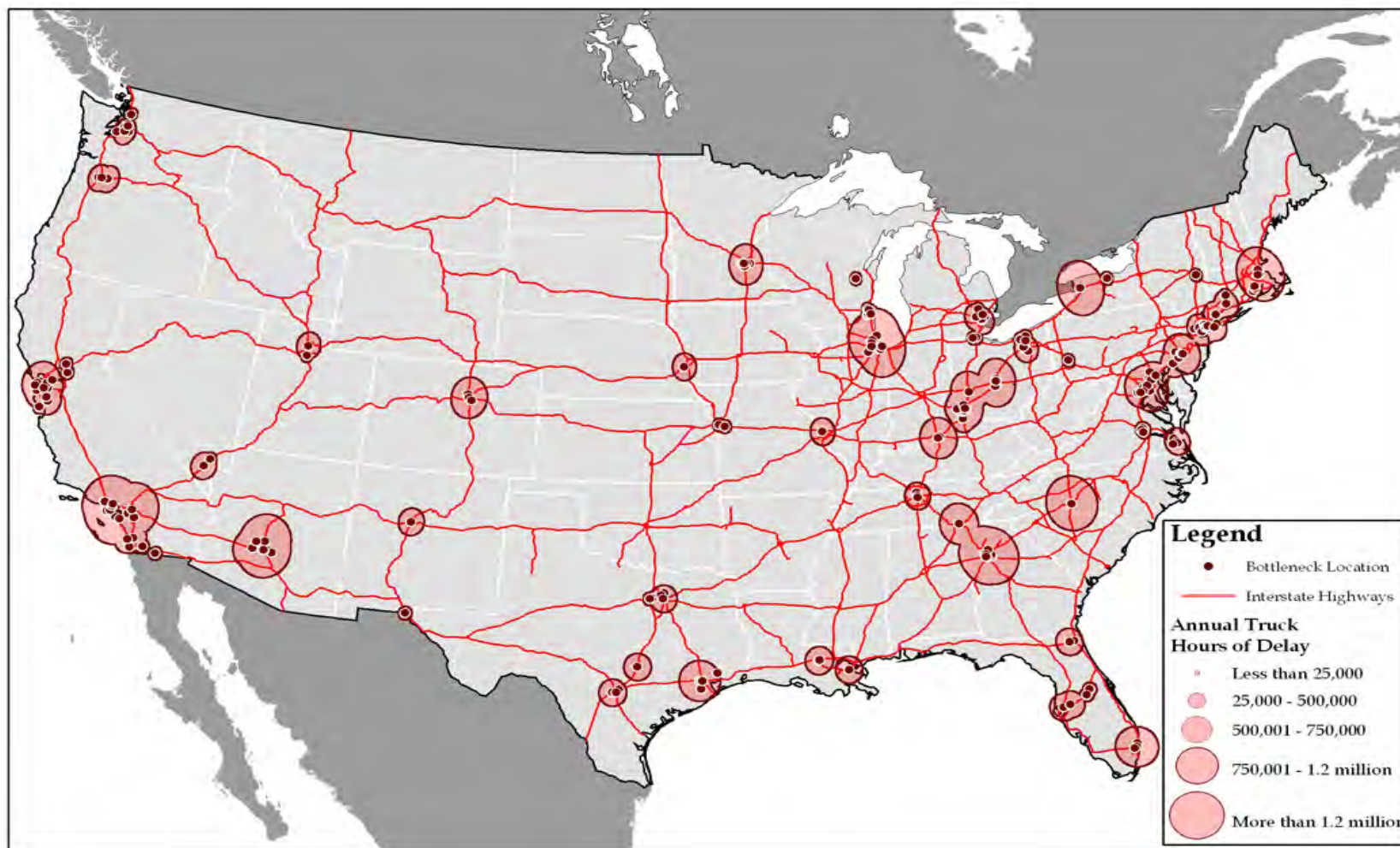


# North American Rail Network

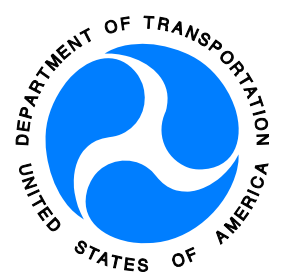




# Major Freight Truck Bottlenecks



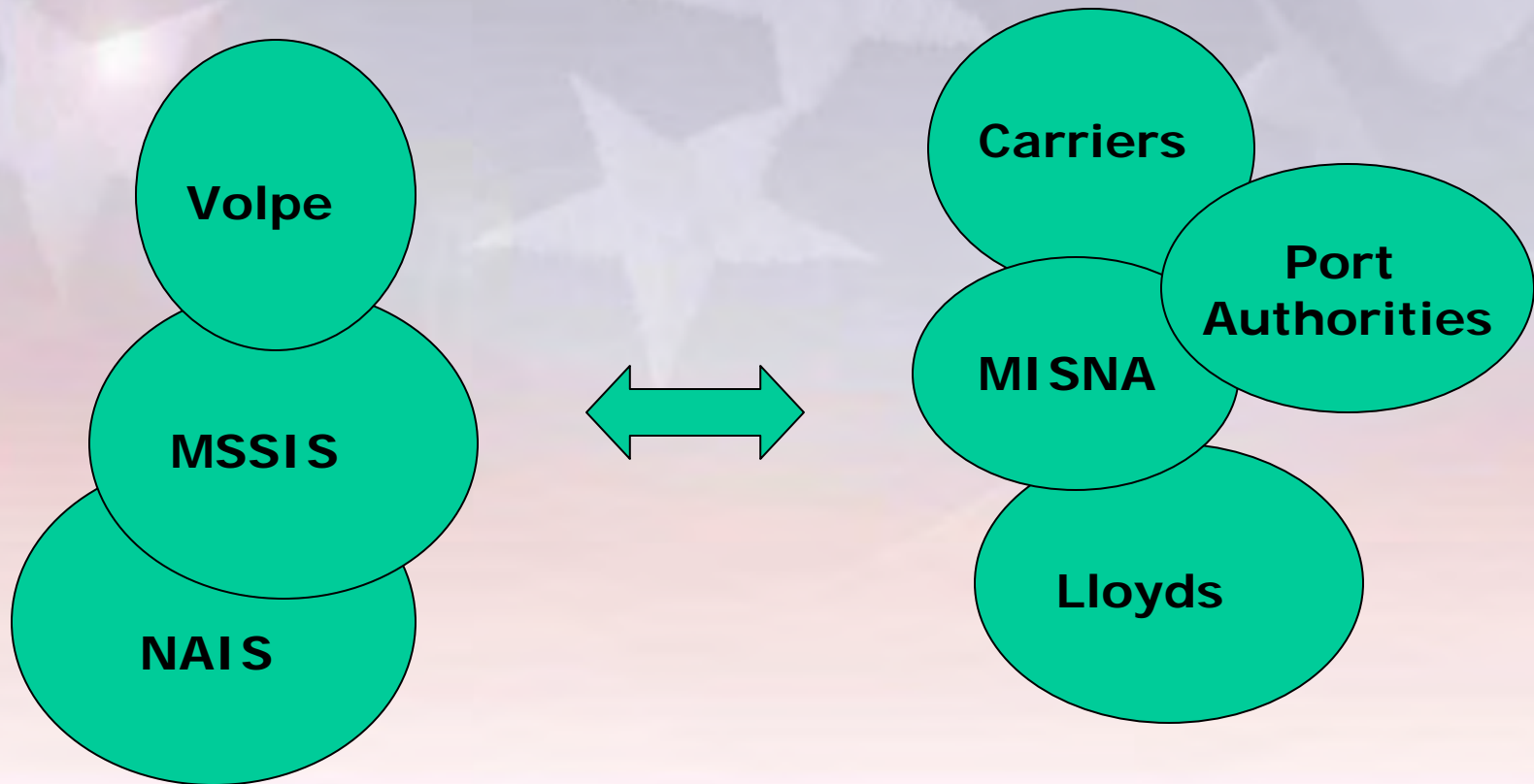




# Government-Industry Partnership



## Vessel Tracking Services



# Ready Reserve Force Hurricane KATRINA relief



## Auxiliary Crane Ship

SS Equality State  
Act as mobile port crane ship 30-120  
ton cranes.  
20' containers: 655



## ROLL-ON / ROLL-OFF

Cape Kennedy & Cape Knox  
Command Post/Rolling stock/  
Power generating capable



## School ship

TS State of Maine  
Relief worker Cap: 236



## Auxiliary Crane Ship

SS Diamond State  
Act as mobile port crane ship  
30-120 ton cranes.  
20' containers: 655



## School Ship

TS Empire State  
Relief worker Cap: 625



## School Ship

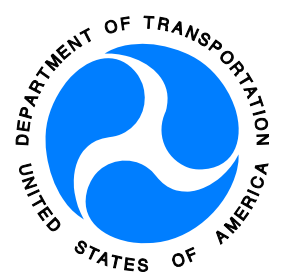
TS Sirius  
Relief worker Cap: 151  
Helo Capable



## Aviation Support Ship

SS Wright  
Relief worker Cap. 315  
Helo Capable; Large water  
production capable; 300-  
20' containers





# Questions



**Owen Doherty**  
**Maritime Administration**  
**[owen.doherty@dot.gov](mailto:owen.doherty@dot.gov)**



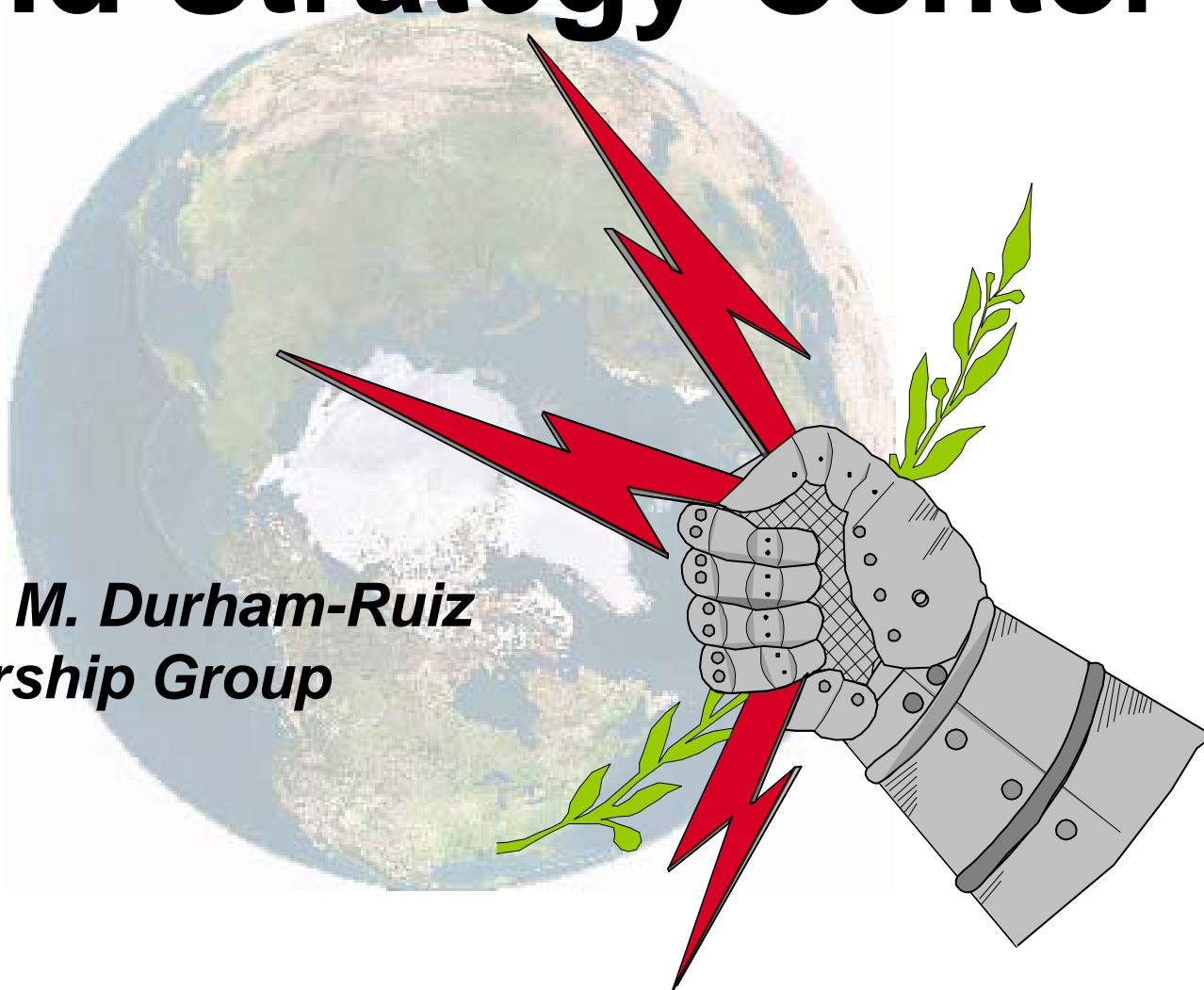


Overall Brief Classified:

UNCLASSIFIED

# Global Innovation and Strategy Center

***Ms. Elizabeth M. Durham-Ruiz***  
***Chief, Partnership Group***



Overall Brief Classified:

UNCLASSIFIED



# ***USSTRATCOM GISC***

## **Mission**

**Provide unique global strategies, timely courses of action and new operational tools and analyses in support of the United States Strategic Command mission set**

## **Vision**

**To be the recognized leader throughout USSTRATCOM and the DoD at bringing innovative solution to bear against tough, 21<sup>st</sup> century challenges**

## **GISC Focus Areas**

- ***Space***
- ***Cyber***
- ***Deterrence***
- ***Data Fusion***
- ***Persistent ISR***





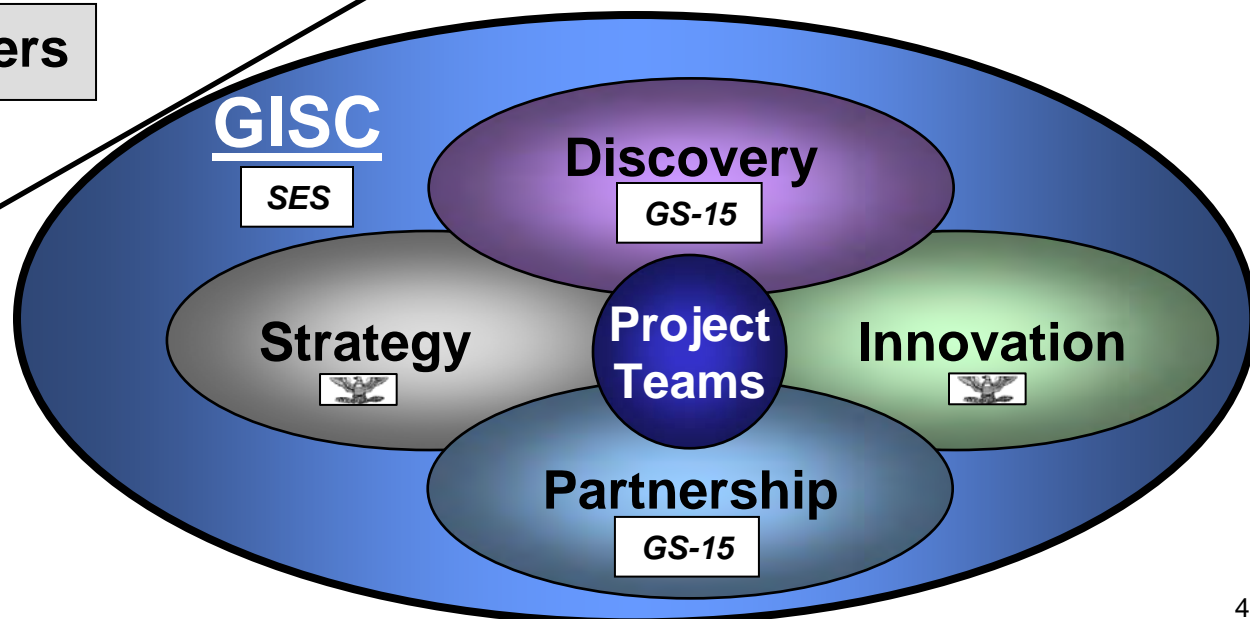
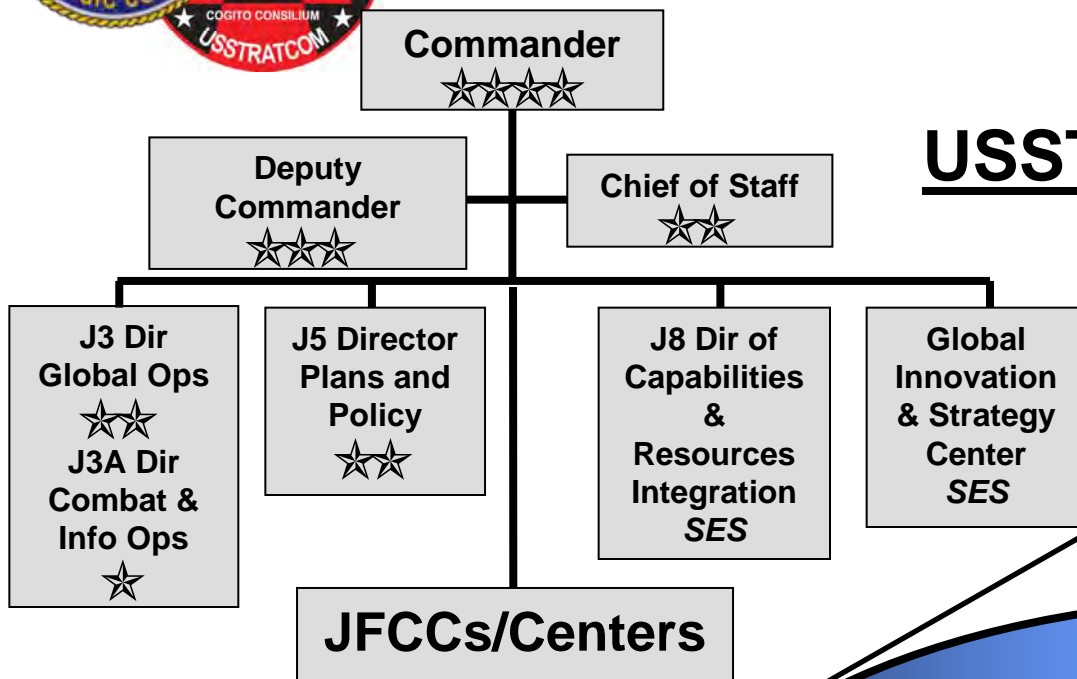
# Why a GLSC?

- Our adversaries do not distinguish between America's military, commercial and civilian interests
- America's strength lay in its ability to **leverage the Nation's diverse experiences and intellect**
- “We can both learn from and help others through a **proactive outreach program to nontraditional partners.** Academia, industry, think tanks, and a host of other organizations possess a wide-range of expertise and insights invaluable to finding solutions to our most pressing problems.” ~ General Pace

**Leverage the Nation's intellect to solve our most pressing problems**

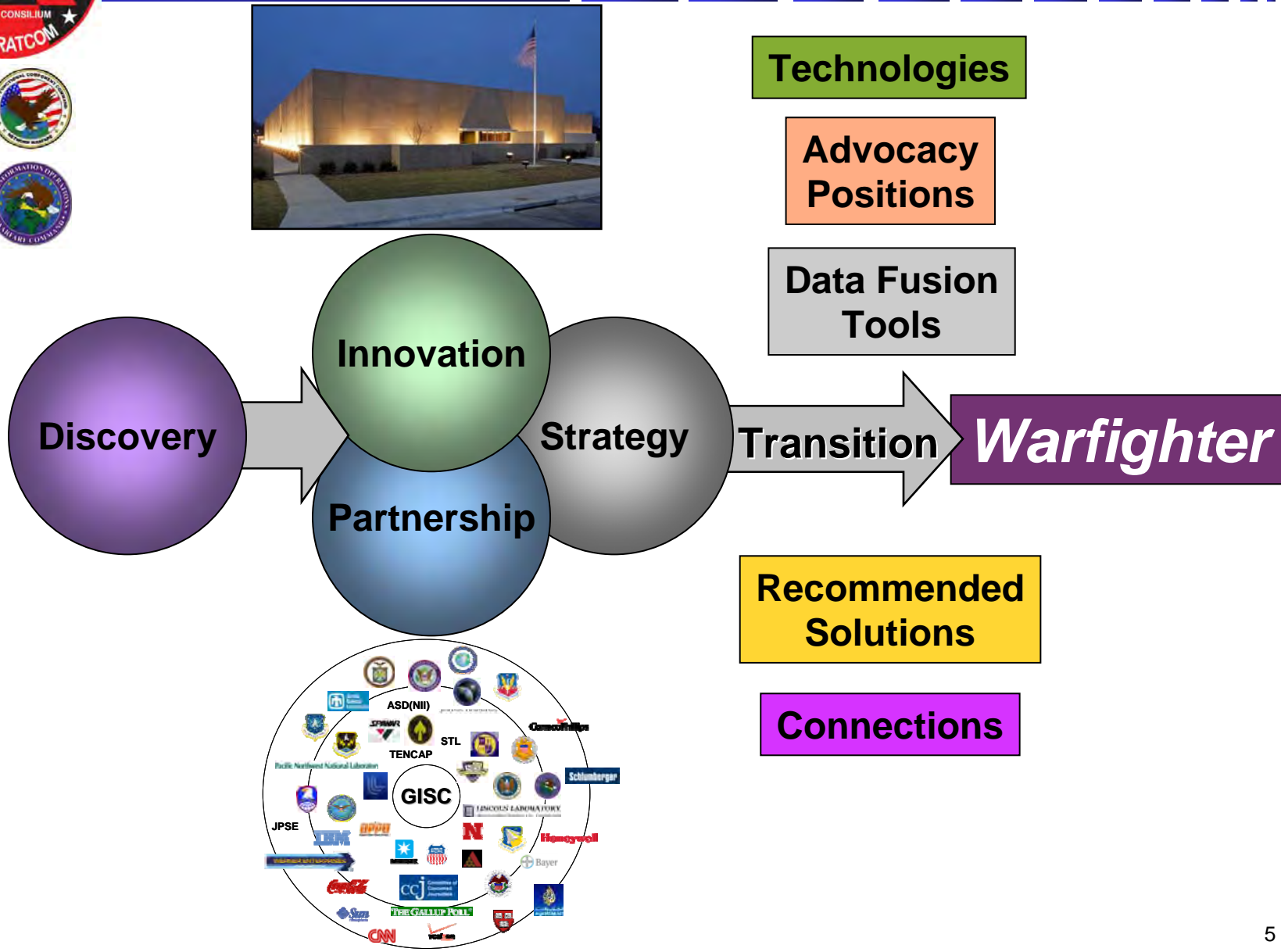


# Organizational Relationships



**Requests**

DEPARTMENT OF THE AIR FORCE  
DEPARTMENT OF THE NAVY  
DEPARTMENT OF DEFENSE  
DEPARTMENT OF ENERGY  
DEPARTMENT OF THE INTERIOR  
DEPARTMENT OF THE STATE  
GREAT SEAL OF THE UNITED STATES





# Pan Sahel Communications

## Jan-Apr 2007 Intern Project

**The Challenge:** Identify communications channels in Africa focusing on Mauritania, Mali, Niger, and Chad

### **Focus:**

- Evaluated recorded audio, radio, participatory communication, billboards, film, mobile phones, internet, digital media
- Rated methods based on access, feasibility, entertainment value, credibility, vulnerability to censorship

### **Status:**

- Provided 11 actionable recommendations
- 100-page final report widely disseminated to DoD, DoS, and the Private Sector

### **Current Projects:**

- Space Debris Mitigation
- Tunnel Detection Technology







# Takeaways

- Focused on the warfighter's challenges
- Leverage the power of partnership
- Lean, agile, responsive and results-oriented



**Identify – Swarm – Solve**





# **U. S. Strategic Command**

## ***Global Innovation and Strategy Center***

**Mr. Kevin Williams, SES, DAF**  
**Director**  
**Global Innovation and Strategy Center**  
**6805 Pine St.**  
**Omaha, NE 68106-2849**  
**(402) 232-2811 / [williamsk@stratcom.mil](mailto:williamsk@stratcom.mil)**

**Ms. Liz Durham-Ruiz, GG-15 (YA-3)**  
**Chief, Partnership Group**  
**Global Innovation and Strategy Center**  
**6805 Pine St.**  
**Omaha, NE 68106-2849**  
**(402) 398-8022 / [durhame@stratcom.mil](mailto:durhame@stratcom.mil)**

## **Questions/Comments?**



**Program Executive Office  
Command, Control, Communications,  
Computers and Intelligence (PEO C4I)**

# **Maritime Domain Awareness (MDA)**

**Oct, 2007  
Andy Farrar  
U.S. Navy PEO C4I  
Andy.Farrar@navy.mil**

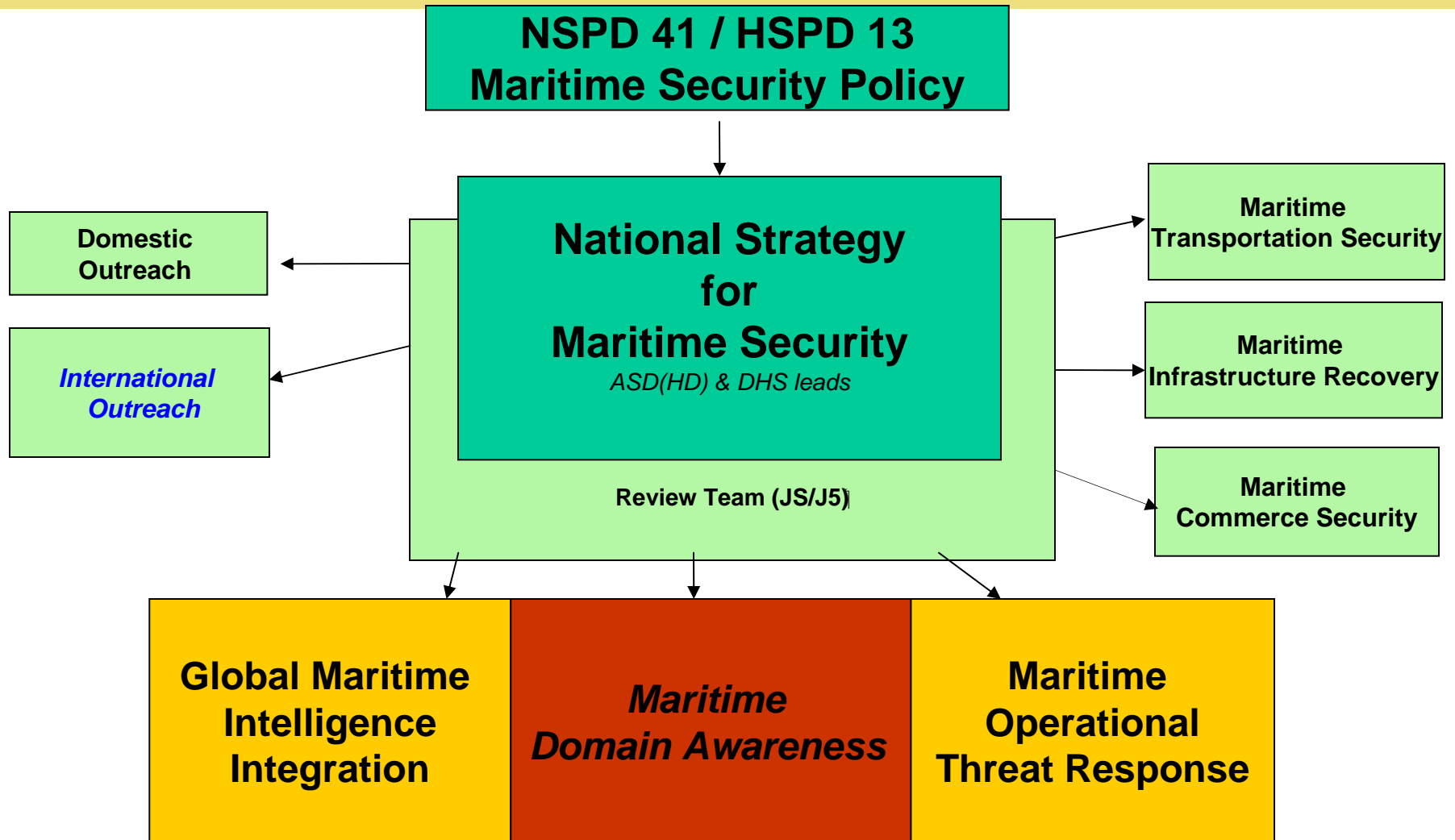
*Distribution Statement A: Approved for public release; distribution is unlimited (Sep 2007)*

**PEO C4I**





# Maritime Domain Awareness Strategic Concept





# MDA Defined

- *Maritime Domain Awareness is the effective understanding of anything associated with the global maritime domain that could impact the security, safety, economy, or environment of the United States.*
  - National Strategy for Maritime Security
- *“No one nation has the resources required to provide safety and security throughout the entire maritime domain. Increasingly, governments, non-governmental organizations, international organizations, and the private sector will form partnerships of common interest to counter these emerging threats”*
  - A Cooperative Strategy for 21<sup>st</sup> Century Seapower





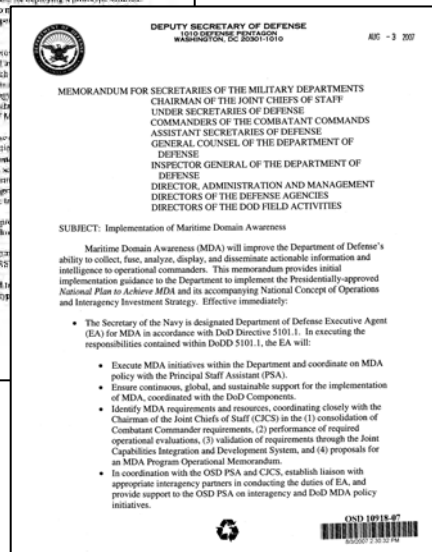
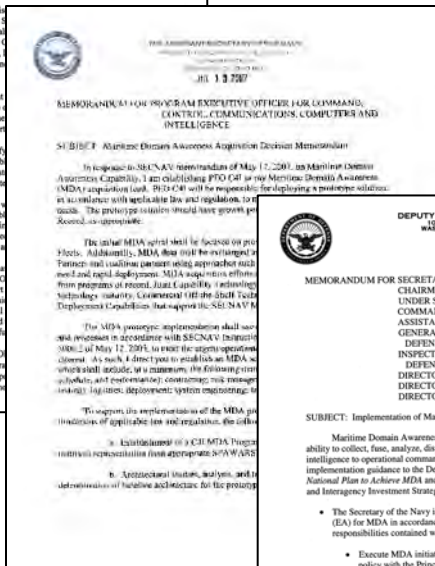
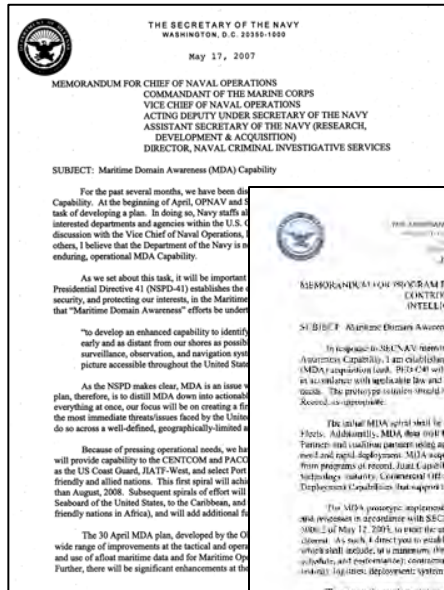
# MDA Requirements

- Persistently Monitor in the global maritime domain:
  - Vessels and Craft
  - Cargo
  - Vessel crews and passengers
  - All identified areas of interest
- Access and maintain data on vessels, facilities and infrastructure
- Collect, fuse, analyze and disseminate information to decision makers to facilitate effective understanding
- Access, develop and maintain data on MDA-related mission performance

*Source: National Plan to Achieve Maritime Domain Awareness*

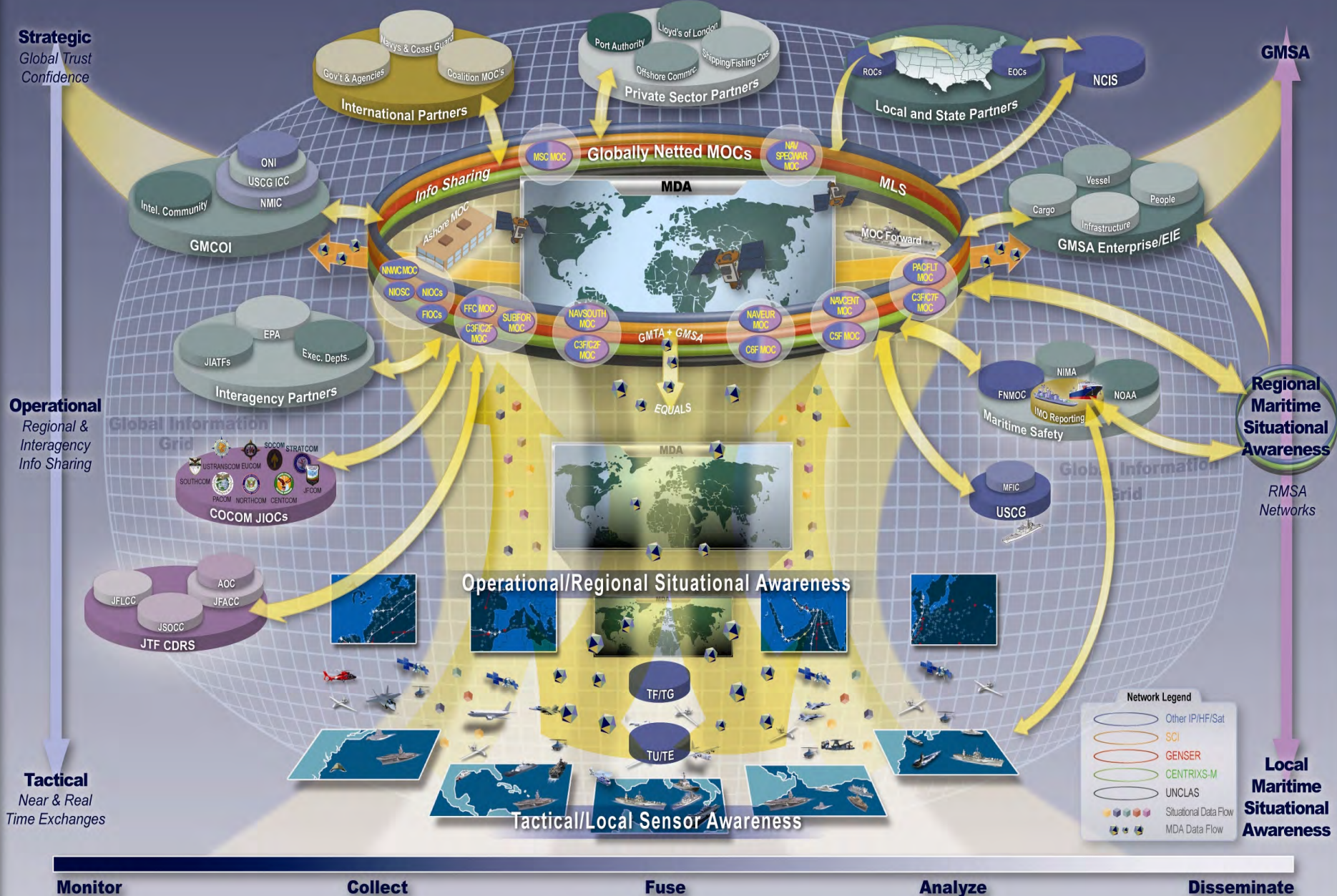


# DON/DOD MDA Acquisition



- 17 May 07 SECNAV memo laid out objectives for expeditiously fielding a prototype MDA capability
- 13 July 07 ASN RDA ADM established PEO C4I as MDA Acquisition Lead
- 03 August 07 SECNAV identified as MDA EA for DOD

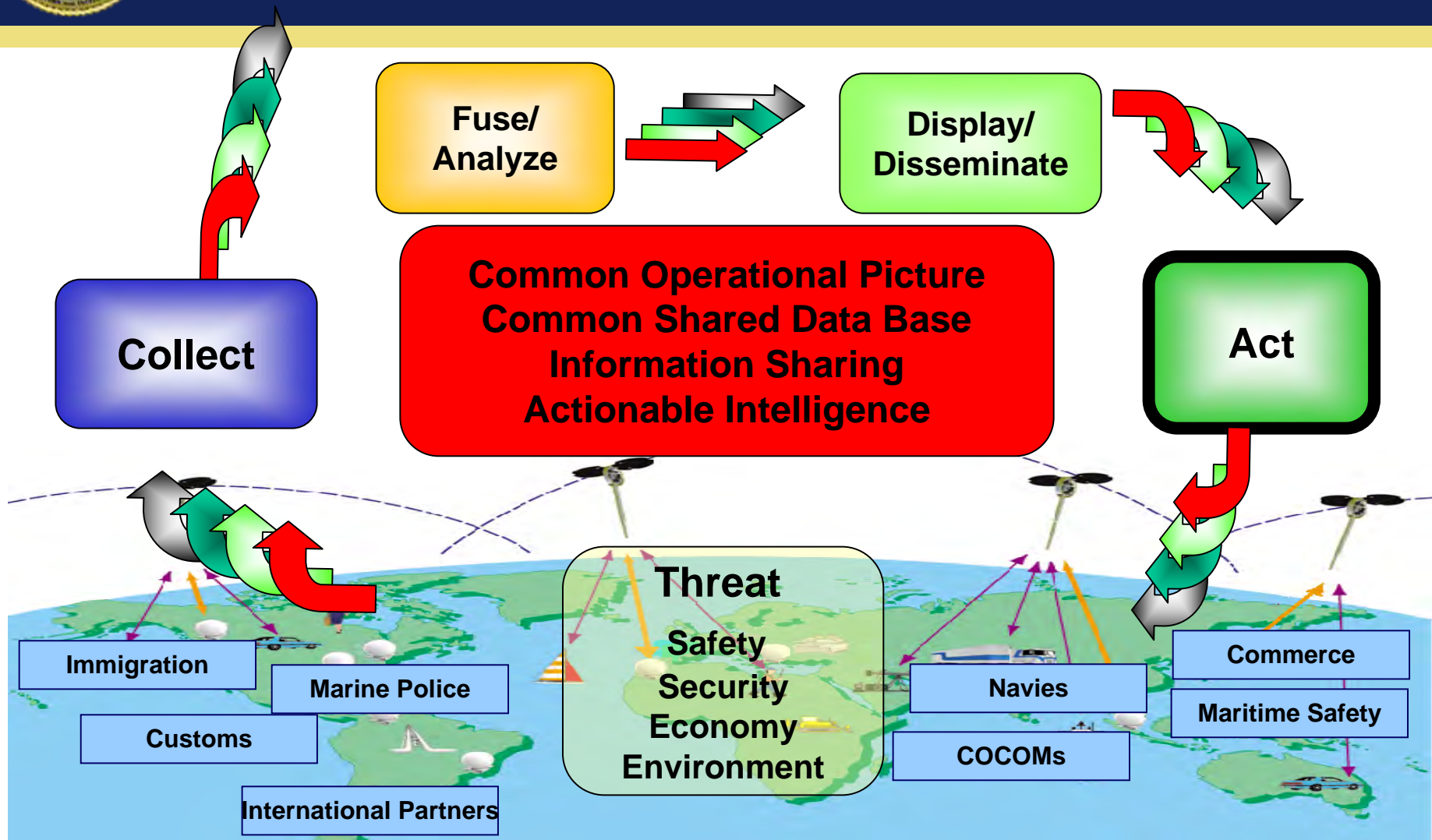
# Navy Maritime Domain Awareness OV-1







# The MDA Concept



Source: NORTHCOM





# MDA Capabilities

- Collect, Fuse, and Monitor/Visualize
  - Vessels, Cargo, People, and Infrastructure
- Analyze
  - Detect anomalies, trends, and patterns
  - Predict behaviors
- Identify threats to the U.S., U.S. forces overseas, or U.S. partners and Allies
- Identify illegal activities
- Collaborate across departments, agencies, coalition and non-traditional partners
  - Collect & Disseminate data from & to the tactical edge
  - Across and at multiple security domains



# Spiral 1 Prototype Goals

- Establish foundation for lasting MDA capability
- Leverage ongoing JCTDs, RTTs, and RDCs
  - Technology maturity is critical
- Use technologies ready for Fleet introduction
- Deploy a select set of MDA capabilities to a limited number of locations
  - CENTCOM & PACOM AORs
  - Interagency Partners
  - Domestic and international port data
- Share data with international strategic partners
- Share data with additional interagency partners
  - USCG, NORTHCOM(\*CMA feed), JIATF-W
- Achieve IOC by August 2008

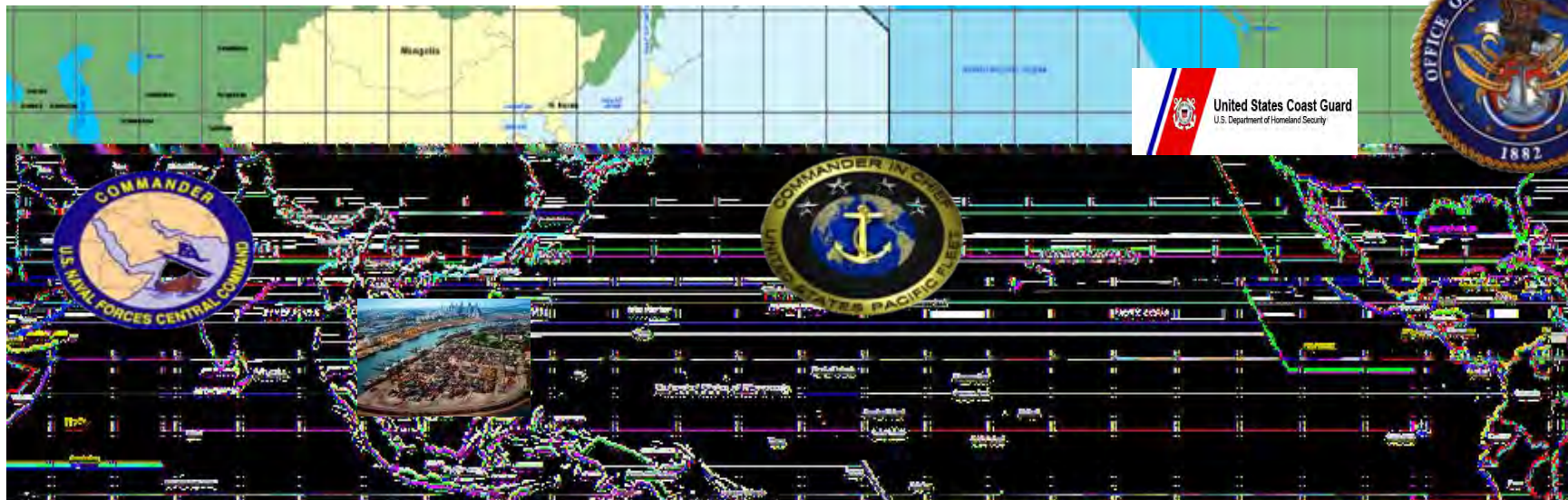


# Spiral 1 Capabilities

- Enhanced Vessel Tracking
- Initial situational monitoring and threat detection
  - Automated monitoring, anomaly detection, and alerting
- Enhanced Extended Maritime Intercept Operations (E-MIO)
- Enhanced sharing of port and coastal data
- Broad collaboration and data sharing capabilities between analyst and agencies, as well as with coalition and non-government organizations
  - CENTRIXS
  - Geospatial visualization tools
  - Collaborative tools – Google, NCES, etc



# Spiral 1 Capabilities/Nodes



## NAVCENT, MIFC-PAC and PACFLT (C3F/C7F\*)

- Limited Anomaly Detection
- Vessel Tracking
- Initial Threat Assessment
- Regional Maritime Data Archives
- Non-Navy Maritime Data Access
- Maritime Data Archives
- Collaborative Toolset

## U.S. Port Data - San Diego

- Integrated port transit & sensor data
- Collaborative toolset

## NCIS Field Sites

- MTAC data fusion-analysis
- Expanded Regional SMEs
- Collaborative toolset

## International Partners

- Collaborative tool set
- Port transit data
- Coastal AIS data\*

## JIATF-W

- Regional Maritime and Law Enforcement Data Archives
- Expanded Regional SMEs
- Collaborative Toolset

## NMIC/ONI

- Global Maritime Data Archives
- Limited Anomaly Detection
- Vessel Tracking and Threat Assessment
- Non-Navy Maritime Data Access
- Collaborative Toolset
- Integrated EMIO data capture and distribution

## Initial AOR Deployers

- Automated Afloat Maritime Data Collection (E-MIO)
- Improved wireless transmission of Biometric data
- Collaborative toolset
- AIS, GCCS-M, HF-IP, SNR



\* some locations will use remote access





# Questions



# Backup



# Acronyms

AIS – Automatic Identification System  
BTR – Below Threshold Request  
CAS – Collaboration At Sea  
CENTRIX-M - Combined Enterprise Regional Information  
Exchange System for the Maritime Environment  
(CENTRIXS-M)  
CFT – Cross Functional Team  
CMA – Comprehensive Maritime Awareness  
COP – Common Operational Picture  
DT – Developmental Testing  
E2E – End-to-End  
E-MIO – Expanded - Maritime Interdiction Operations  
FASTC2 AP – Fast Connectivity for Coalition Agents  
Program  
FDCE – Federated Development & Certification  
Environment  
GCCS-M – Global Command and Control System,  
Maritime  
GCCS-I3 – GCCS Integrated Imagery & Intelligence  
GMSA – Global Maritime Situational Awareness  
IOC – Initial Operating Capability  
JCTD – Joint Capability Technology Demonstration  
JIATF – Joint Inter-Agency Task Force

JTAA – Joint Test Asset Activity  
MAGNET – Maritime Awareness Global Network  
MASS – MDA AIS Sensor Server  
MDA – Maritime Domain Awareness  
MHQ/MOCs – Maritime Headquarters/Maritime Operations  
Centers  
MIO – Maritime Interdiction Operations  
ONI – Office of Naval Intelligence  
POR – Program of Record  
QRA – Quick Reaction Assessment  
RTT – Rapid Technology Transition  
RDC – Rapid Development Capability  
SCC-J – Sector Command Center-Joint  
SIMEX – Simulation Exercise  
SMS – Sensor Management System  
SSAA – System Security Authorization Agreement  
TAANDEM – Track Assessment and Anomaly Detection  
Maritime  
TTP – Tactics, Techniques, and Procedures  
TW 08 – Trident Warrior 08



# ***MDA Day 2007, New Orleans***

## ***Maritime Domain Awareness***

## ***National ConOps***

***D. A. Goward***

***Director, Maritime Domain Awareness  
Program Integration, United States Coast Guard***

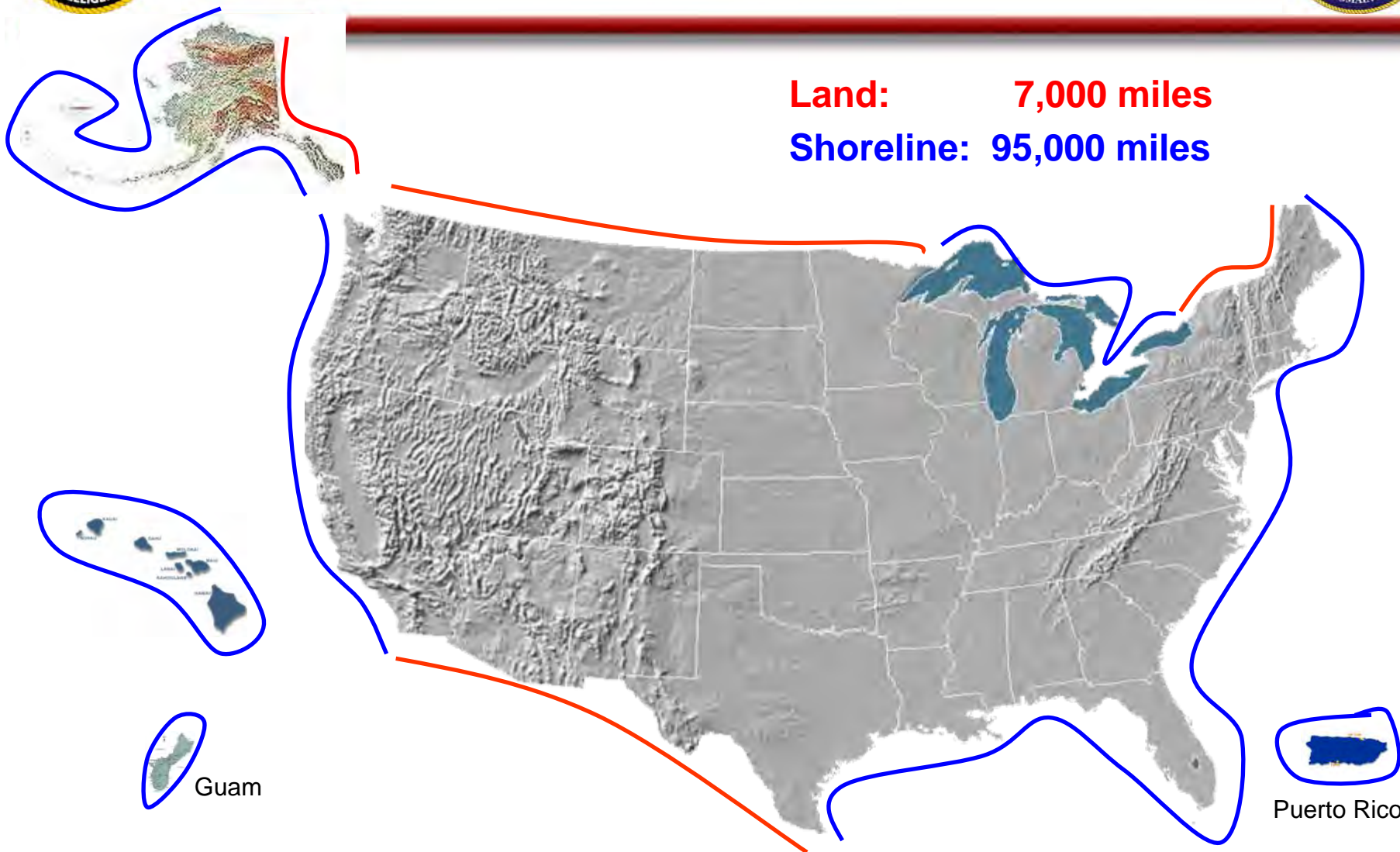




# *A Maritime Nation*

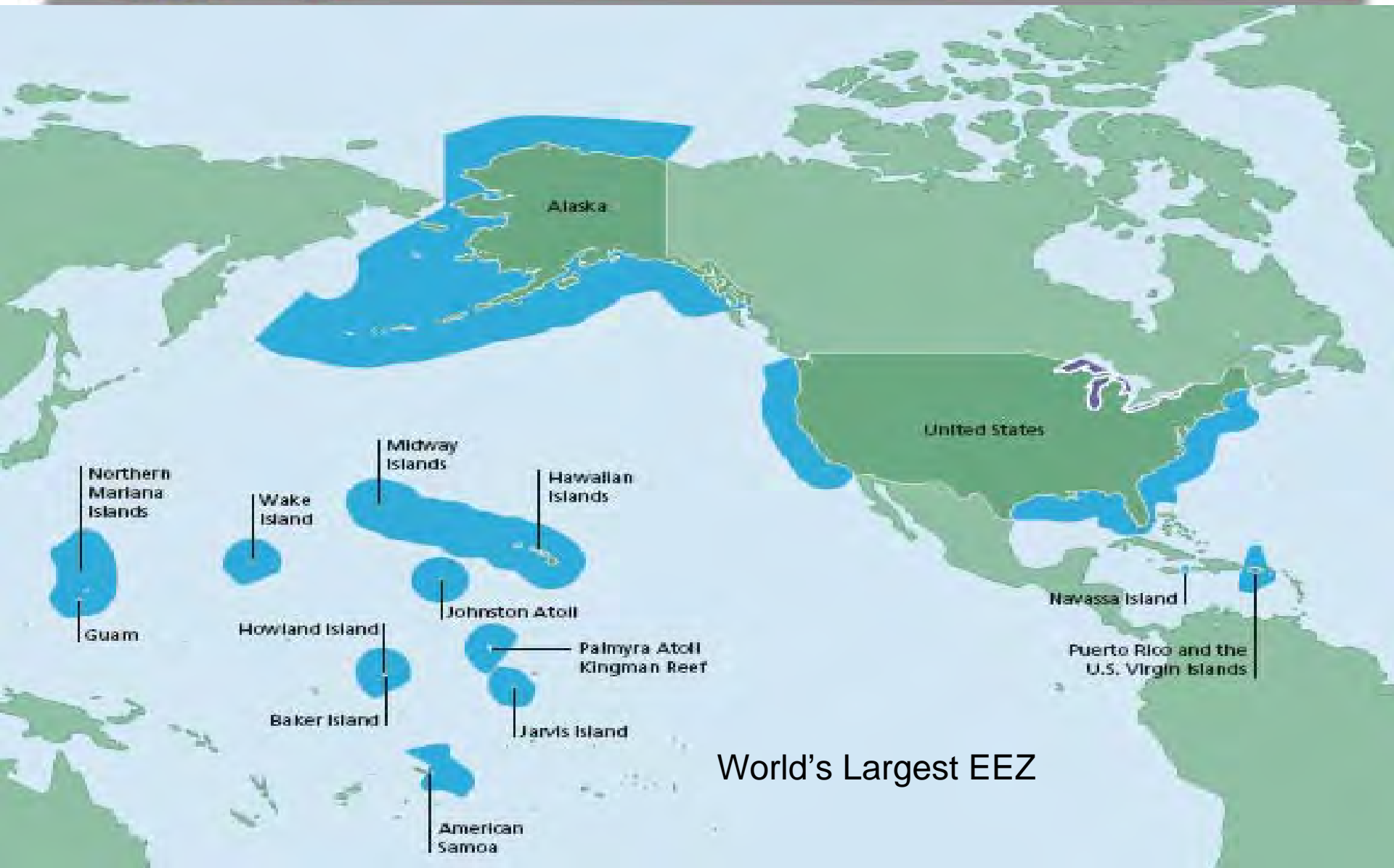
**Land: 7,000 miles**

**Shoreline: 95,000 miles**





# *A Maritime Nation*



World's Largest EEZ



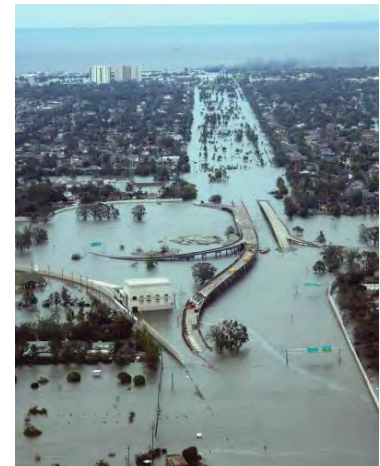
# *A Maritime Nation*



- 95% of U.S. foreign trade
- 8,000 foreign vsls, 50,000 port calls/yr
- \$800 Billion in freight per year
- 361 commercial ports
- 186 Million passengers per year



- 17 Million recreational vsls
- 70% of population is coastal
- Key Infrastructure & Services







# *A Maritime Nation*



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# *Why MDA is Essential*

## **Value of transparency**

- **Deter, Detect, Prevent, Respond**

## **All Threats/ All Hazards/ All Missions**

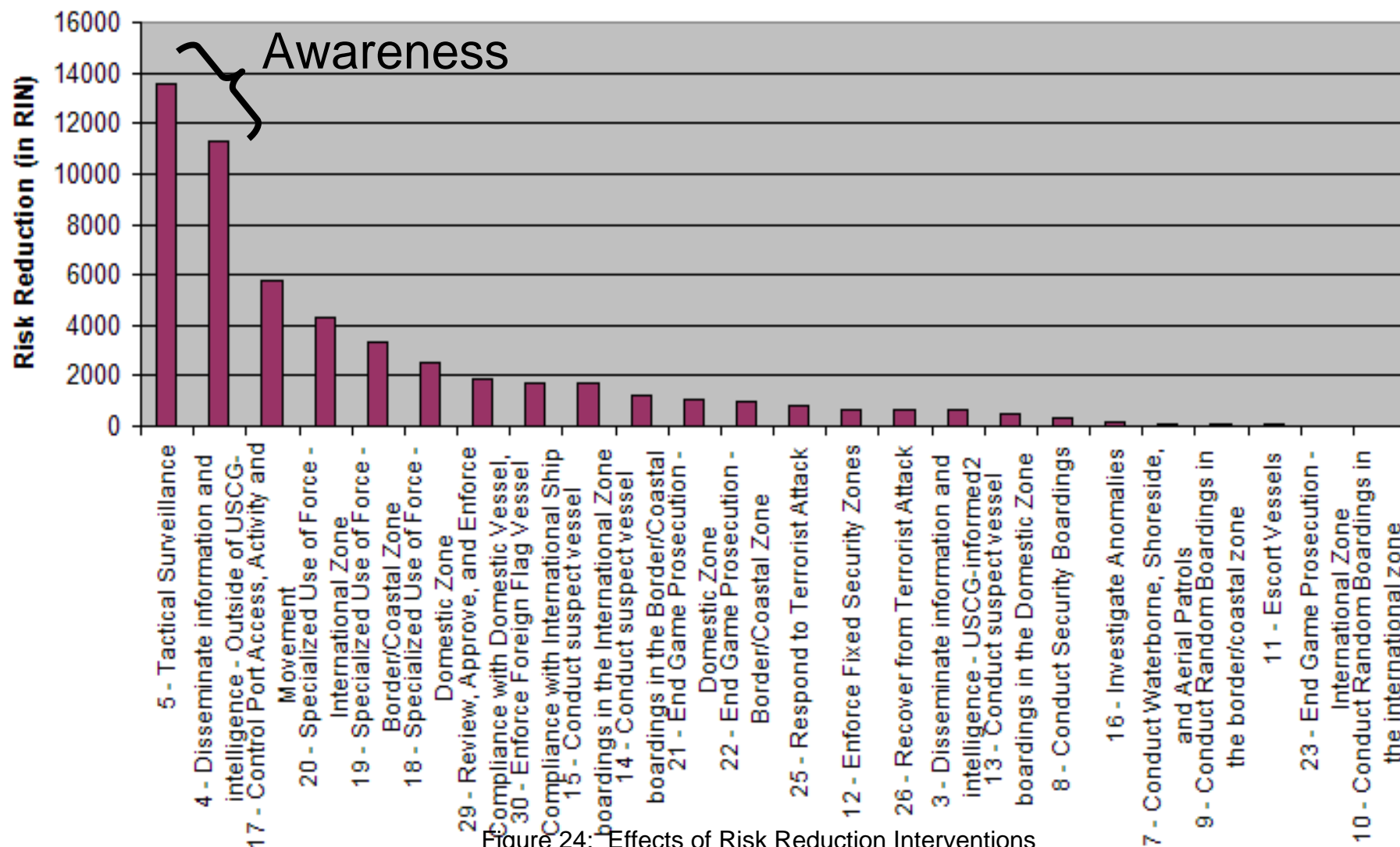
- **Asymmetric Threats**
- **Safety, Security, Stewardship**
- **Many Partners**

## **Coalition Warfare/ Unity of Effort**



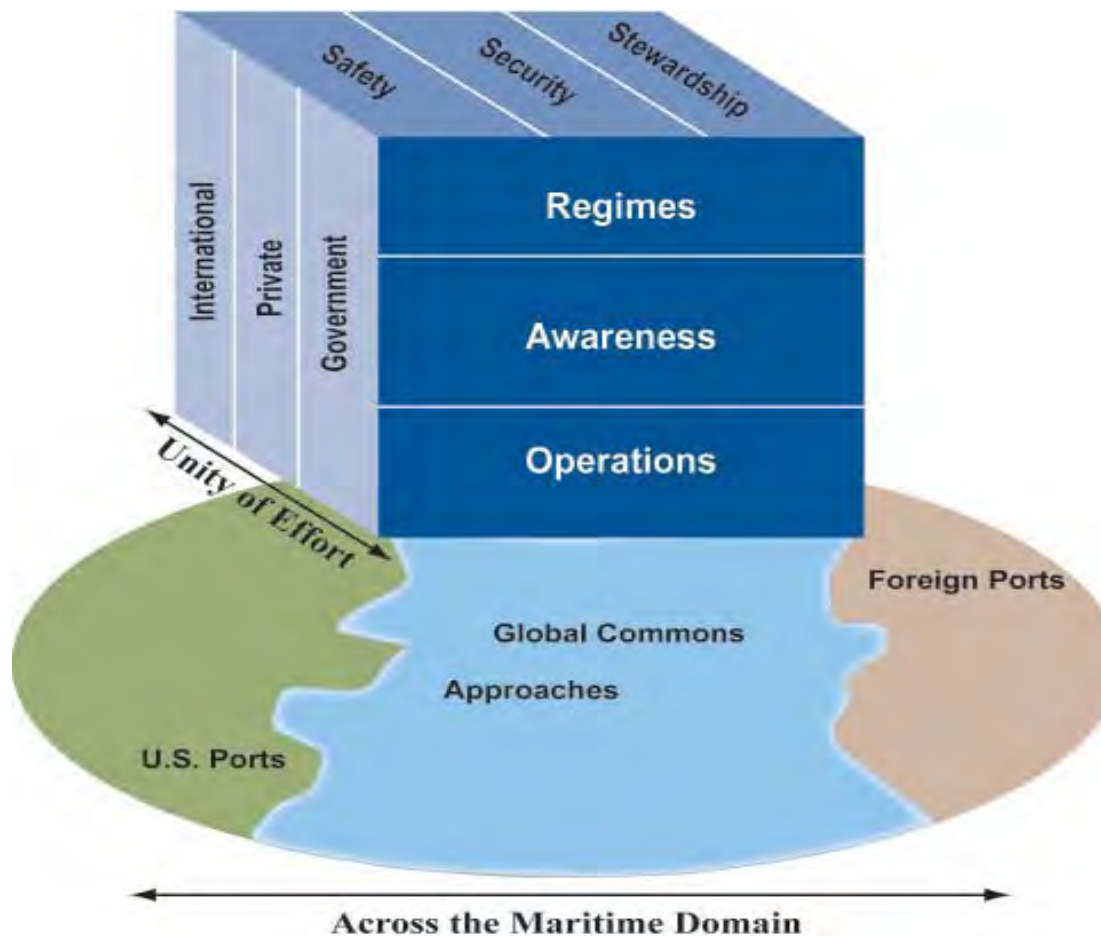
# Essentiality of Awareness

## Appendix D – CMT Strategic Planning Analysis Results





# *Maritime Governance Strategic Triad*





## *MDA Pre-9/11*



- 1998 - Coast Guard 2020 -- Strategic Plan
- 2000 - Special Interest Vessel Program
- 2001 - NSC involvement and Interagency MDA TF
- 2001 - Maritime Security Strategy and MDA White Papers
- 2001 (Aug) - ADM Loy article on MDA





## *MDA Post-9/11*



- 2002 - USCG MDA Project Officer
- 2003 - Competing USCG Projects
- 2003 - USCG MDA PIO & Steering Committee
- 2004 - National MDA Summit & Senior Steering Group
- 2005 - NSMS & National Plan to Achieve MDA
- 2006 - GMII Director, 2007 - GMSA Director
- 2007 - DoD Executive Agent for MDA (SecNav)



# *Important Terms & Concepts*

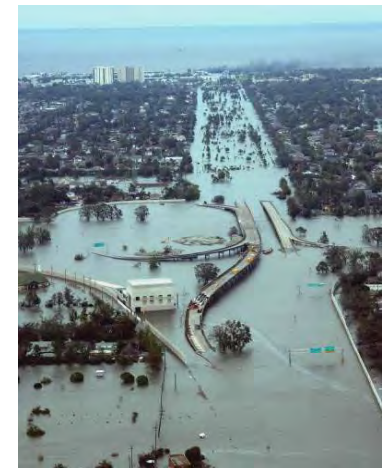
- **Maritime Domain Awareness**
- **Global Maritime Intelligence**
- **Global Maritime Situational Awareness**
- **Common Operational Picture**
- **User Defined Operational Picture**
- **Services Oriented Architecture**
- **Federal Governance Structure**
- **Enterprise Hubs**



# *Maritime Domain Awareness (MDA)*



“...the effective understanding of anything associated with the global Maritime Domain that could impact the security, safety, economy, or environment...”





# *Maritime Domain Awareness (MDA)*



$$\text{MDA} = \text{GMI} + \text{GMSA}$$

## **GMI:** *Global Maritime Intelligence*

- Predictive threat warning and cueing
- Response to decision maker requests



Cued Intel, IC Products...

## **GMSA:** *Global Maritime Situational Awareness*

- Unclassified
- Identify/understand trends
- Anomaly detection
- "Maritime Normal"

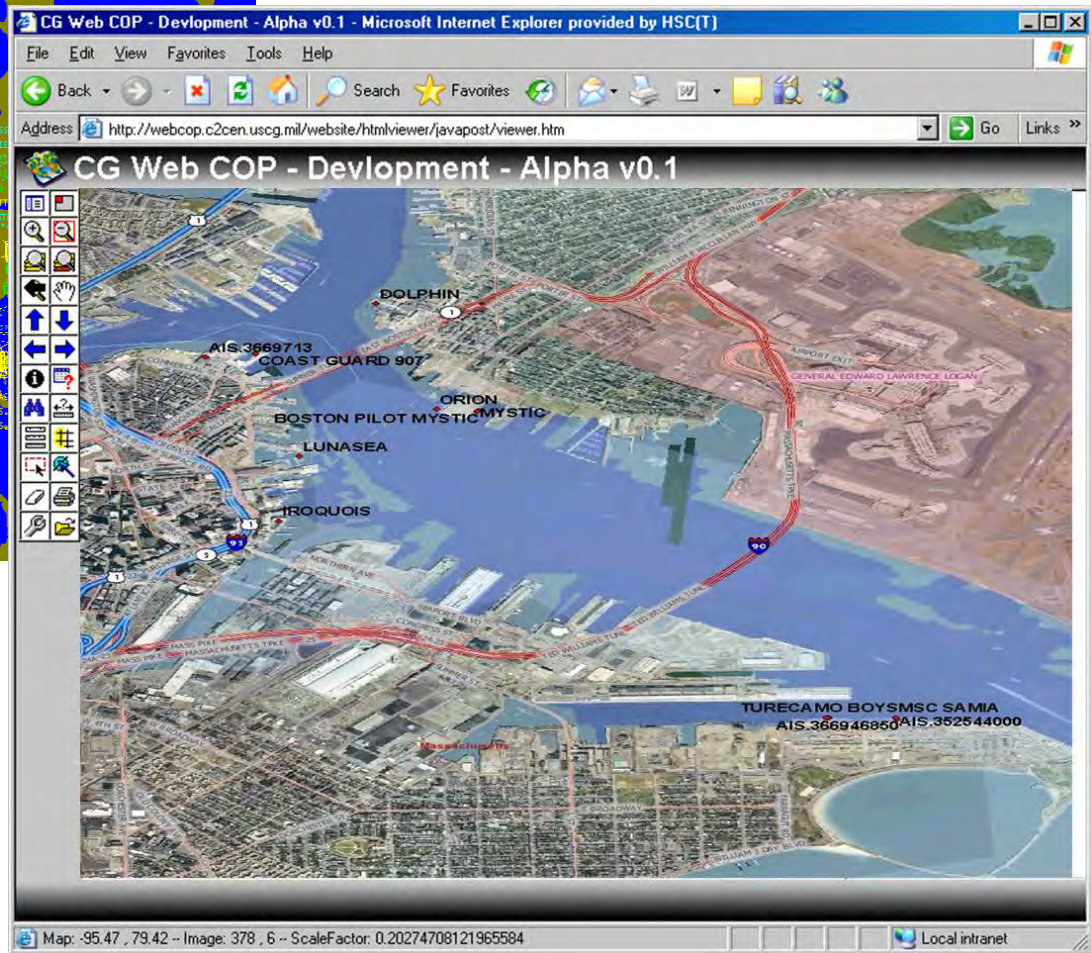
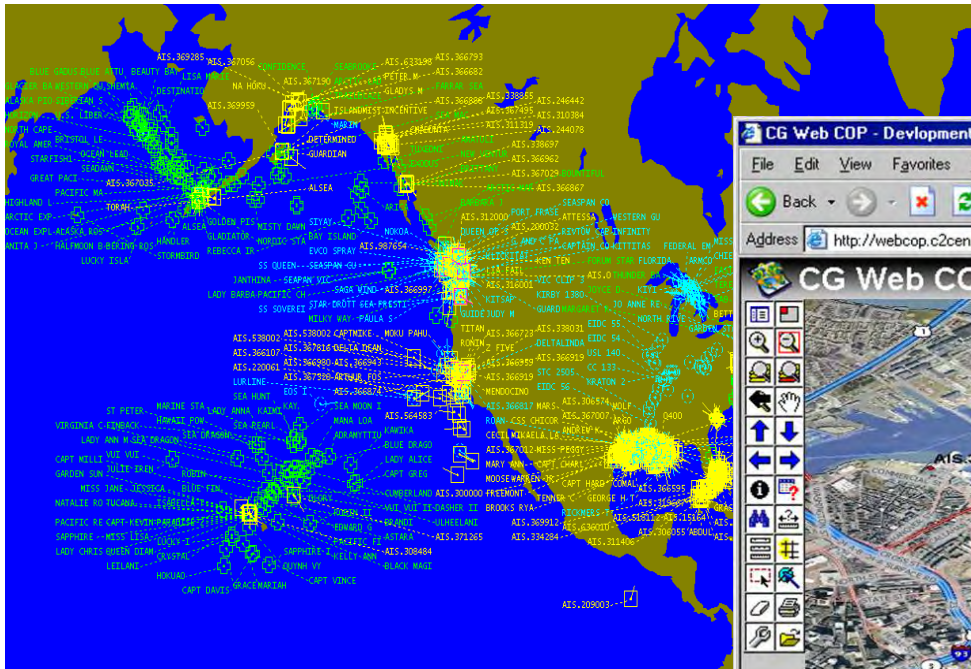


Persistent monitoring,  
Anomaly Detection...





# COP & UDOP



UNCLASSIFIED



# *COP vs UDOP*



## Common Operating Picture

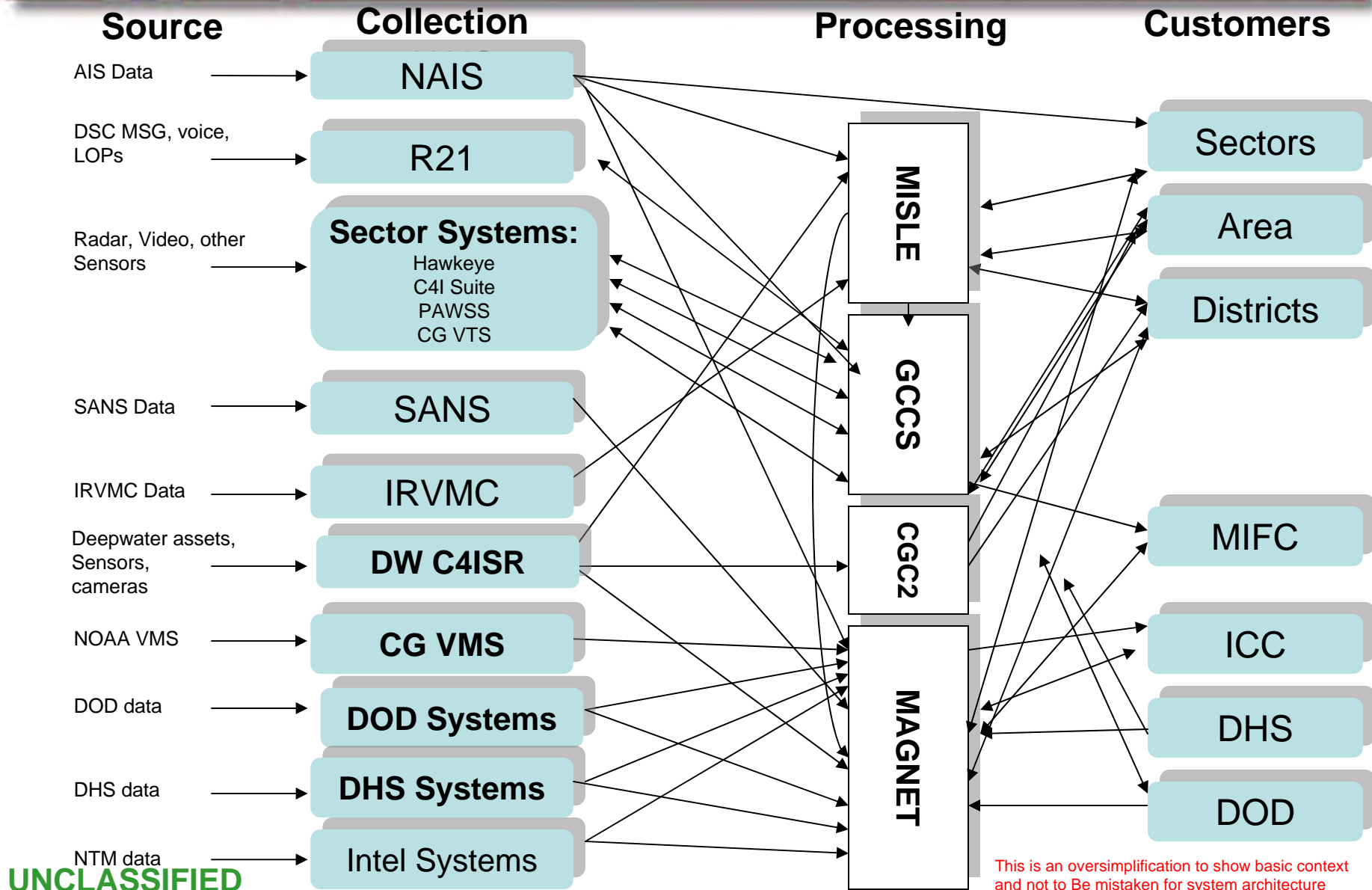
- One picture/view
- Central analysis
- High bandwidth
- Point to point sharing
- Difficult to modify

## User-Defined Operating Picture

- Standard data, infinite pictures/views
- Access to raw data/Everyone an analyst
- Only needed info transmitted
- Community data sharing
- Easy to add users, applications

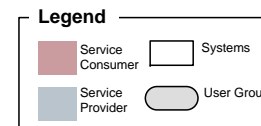
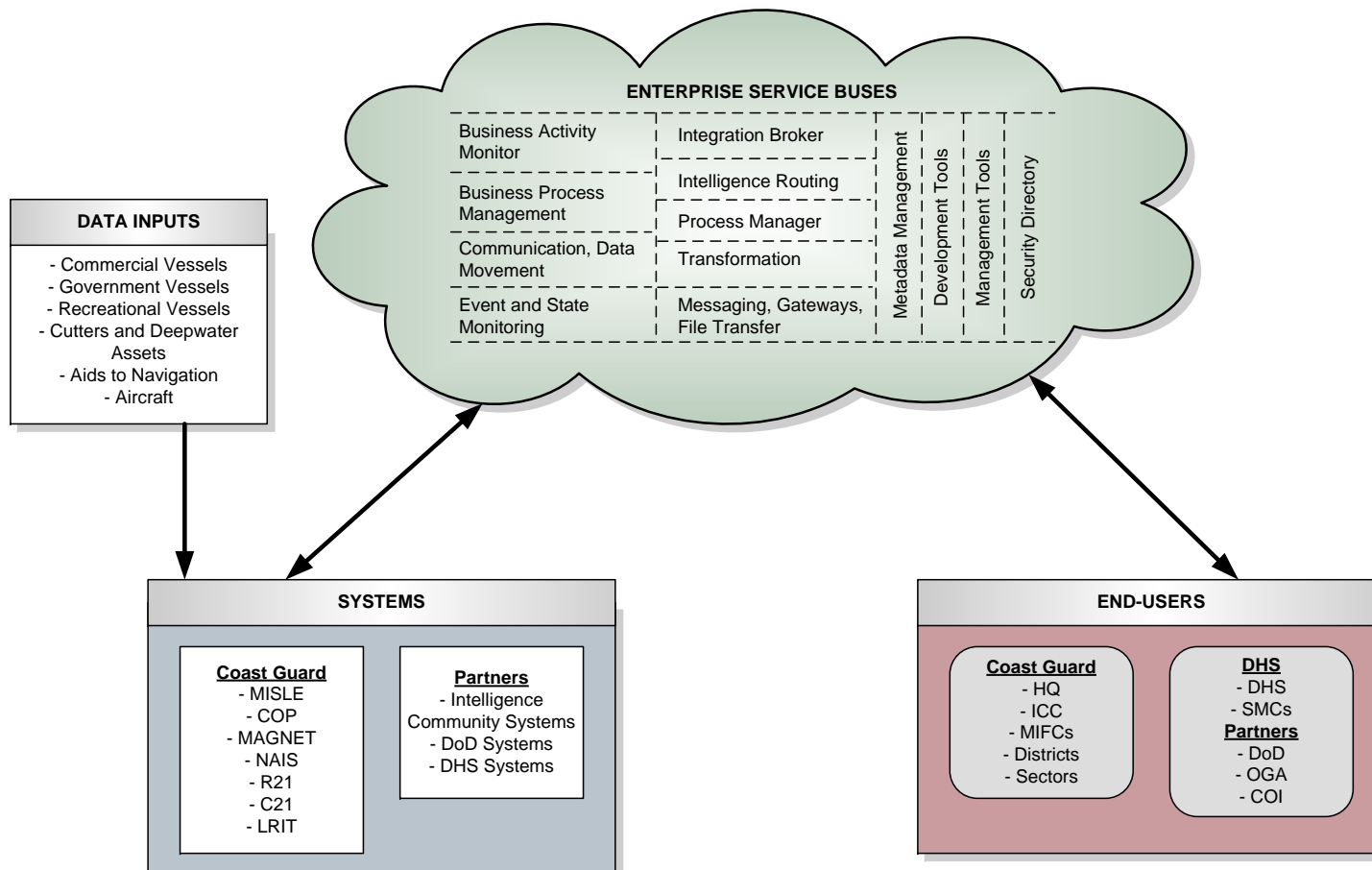


# Current Point-to-Point Data Sharing





# Services Oriented Architecture







# *Federal MDA Governance*



## THE NATIONAL STRATEGY FOR MARITIME SECURITY

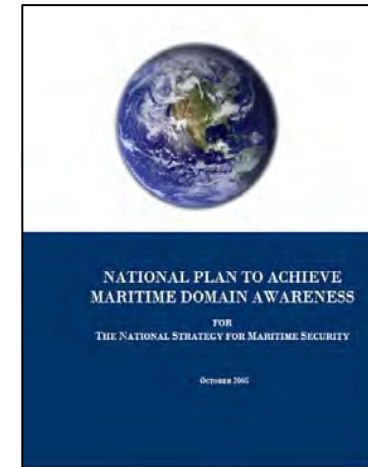
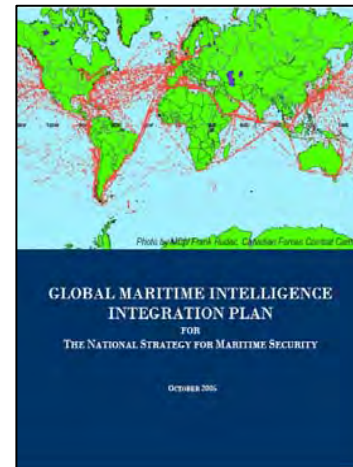
September 2005



“Maritime Domain Awareness...

a key national security requirement...

requires integrating all-source  
intelligence, law enforcement  
information, and open-source data  
from the public and private sectors...



UNCLASSIFIED



# *National Plan to Achieve MDA*



## Goals

- Enhance transparency
- Enable accurate, dynamic and confident decisions and responses
- Freedom of navigation and flow of commerce

## Objectives

- Persistently monitor the global maritime domain
- Access and maintain data on vessels, cargo, facilities, people and infrastructure
- Collect, fuse, analyze, and disseminate information
- Access, develop and maintain MDA-related mission performance data

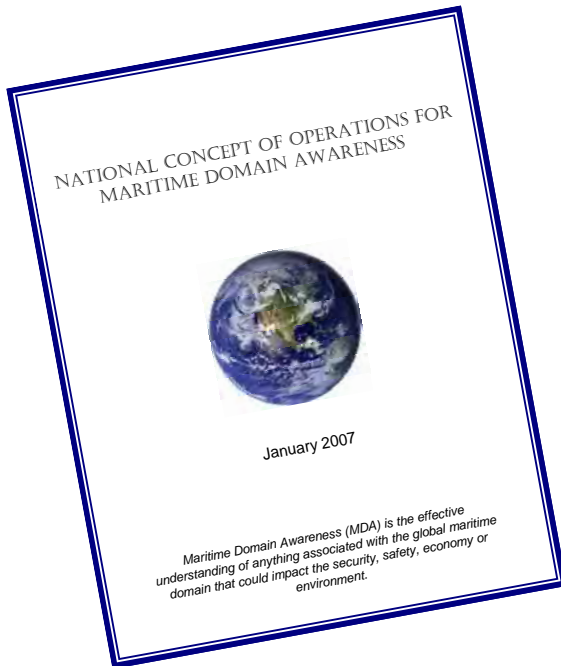


# *Concept of Operations for MDA*



At a minimum the CONOPS will detail:

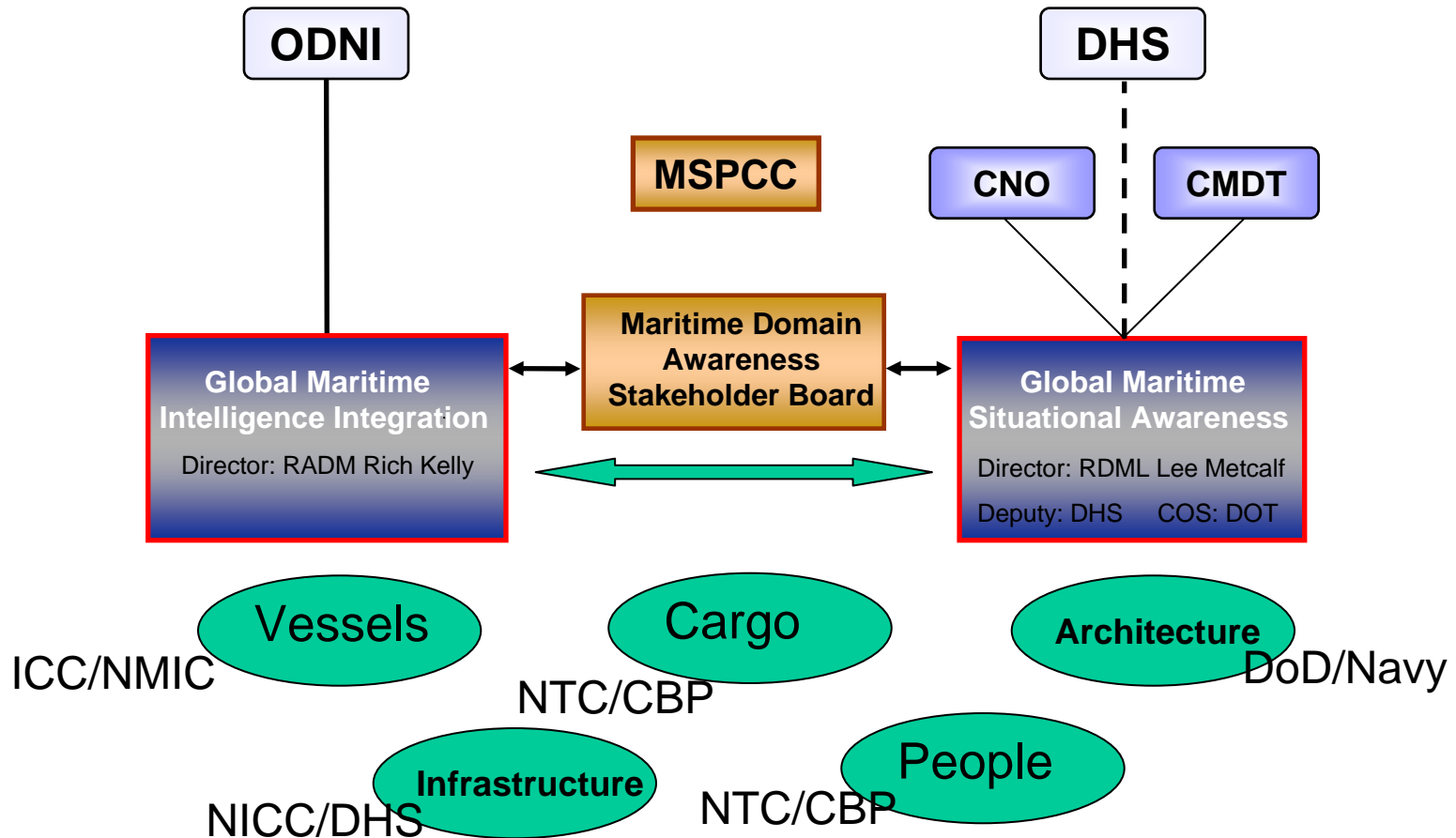
- Interagency Coordination
- Shared Situational Awareness
- Support MOTR
- Integration with GMII





# National MDA Structure

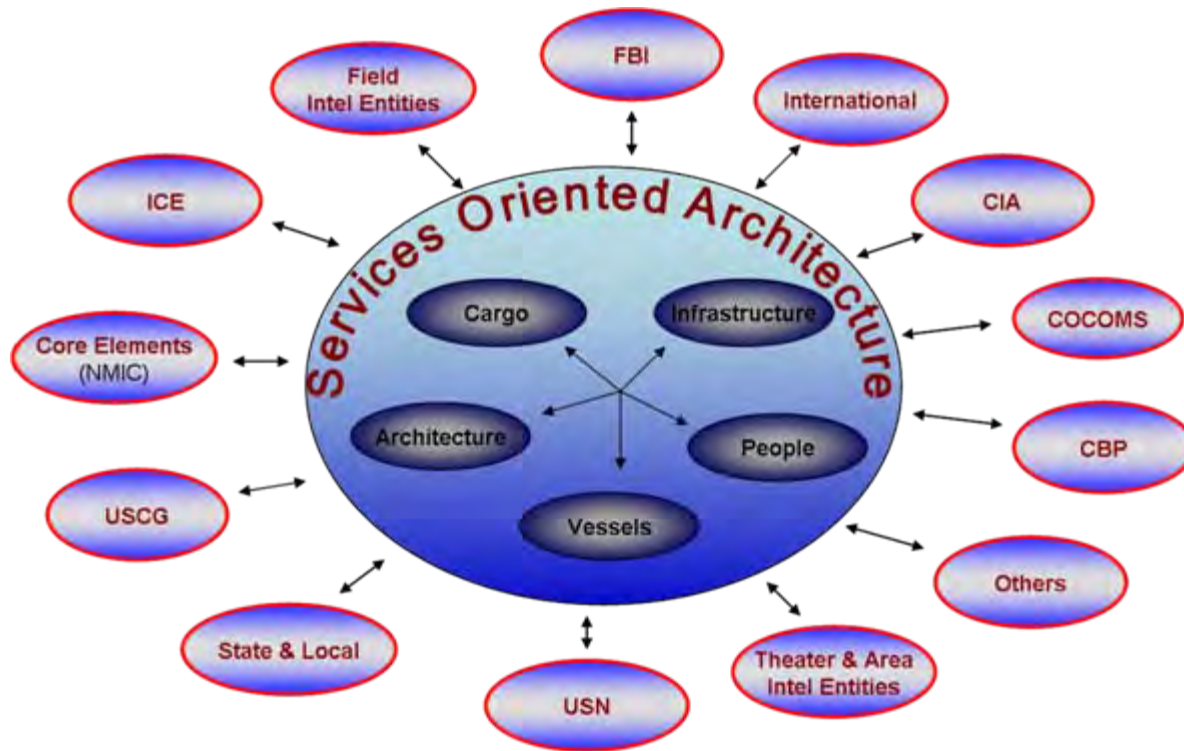
*A federal, interdepartmental and interagency leadership structure*







# *Enterprise Hubs*

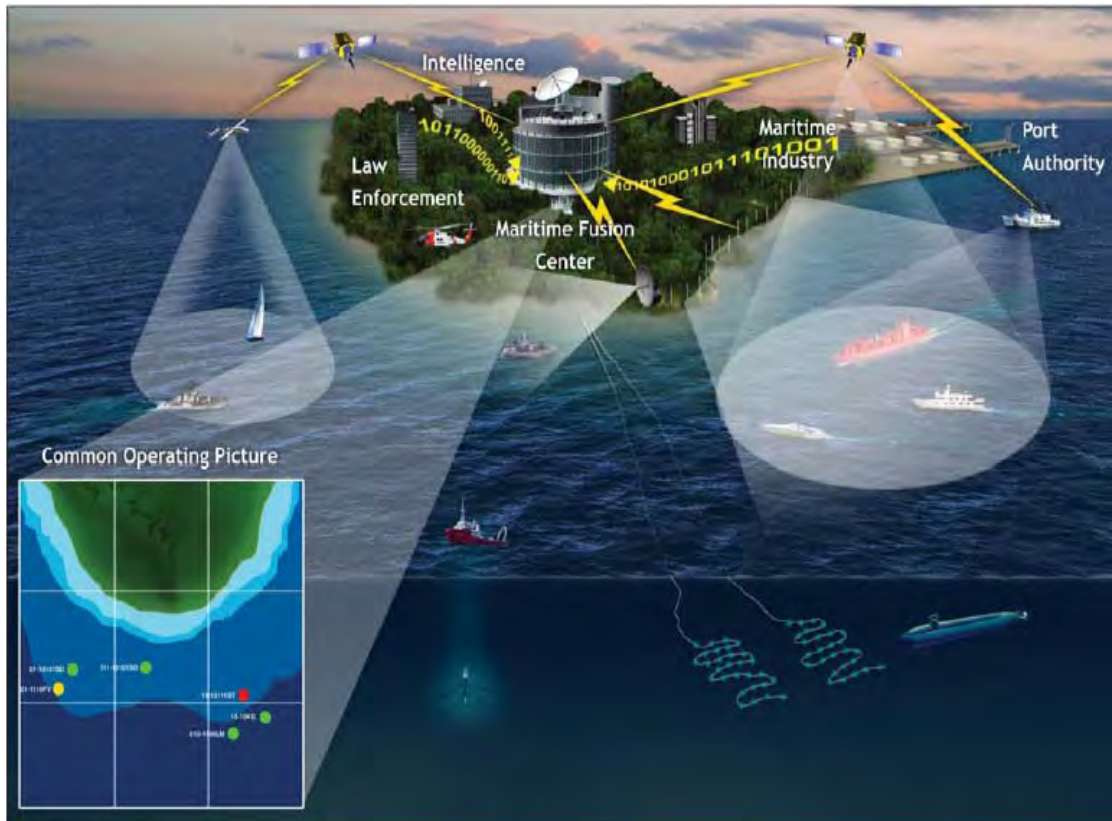


Inventory & Catalog  
Facilitate Sharing

Coordinate Information Flow  
Identify Gaps



# *The Goal – Level 3*



National Maritime Picture

**Understand:**

- 1. What happened**
- 2. What is happening**
- 3. What will happen next**



*Questions?*



# **TACSAT-2**

## **Target Indicator Experiment (TIE)**

### **AIS Payload Overview**

**2007 Maritime Domain Awareness Forum**  
**29 October 2007**

**Christopher Huffine**  
**Technical Staff, Code 8120**  
**Naval Research Laboratory**  
**202-404-4272**  
**[huffine@nrl.navy.mil](mailto:huffine@nrl.navy.mil)**





# Purpose

- **Brief overview of the Naval Research Laboratory (NRL) Target Indicator Experiment (TIE) Automated Identification System (AIS) payload**
  - TACSAT-2, the host spacecraft
  - Top level architecture
  - AIS receiver attributes
  - Phased array antenna attributes
- **Top Level Data Flow**
- **Brief mention of regulatory and authorities which provided non-technical challenges**
- **Some snapshots of TIE data collections**
- **Way forward**



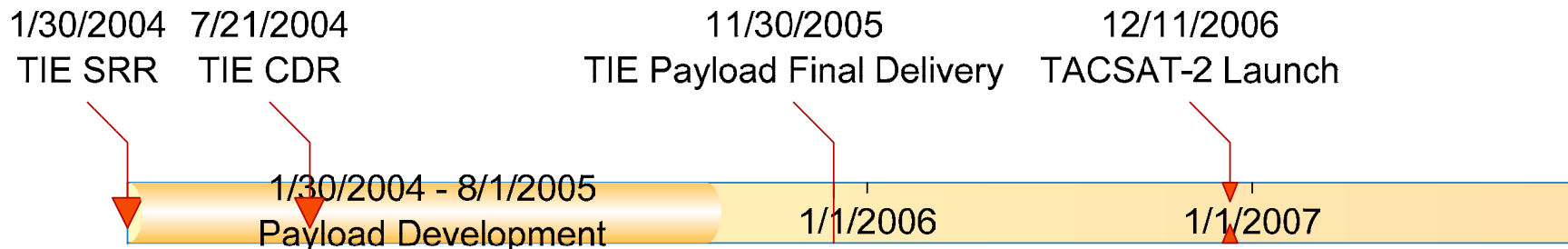
# Genesis of AIS on TACSAT for Experimentation

## Objectives

From Original Space Test Program (STP) objectives

### 2) Experiment w/ Space Collection of AIS From Ships for Port Safety & Homeland Defense

- At the time the TIE development opportunity presented itself, the TIE team had just concluded TACSAT-1 development
- Team was looking to take the next logical step in reducing size, weight and power while adding new functionality
- Adding AIS capability to original payload foundation met internal goals for working with software defined radios and demonstrated a measure of effectiveness to emerging requirements (i.e. receiving AIS messages)



1/30/2004

10/29/2007



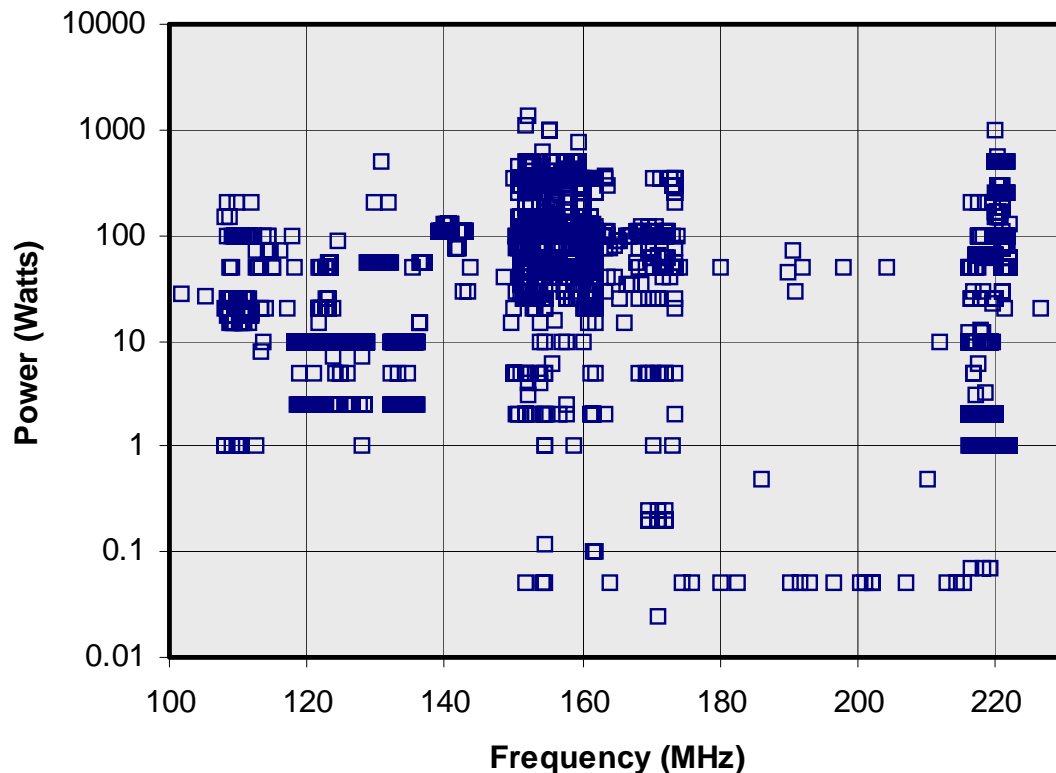
# AIS Receiver Development

- Receiver itself funded through Office of Naval Research (ONR) and the Copperfield-2 foundation primary through Navy N6 TENCAP funds
- Government, Industry, FFRDC Joint Effort
  - Aeronix, Inc developed the processor card which was “reprogrammed” to demodulate the AIS waveform
  - Aerospace Corp (Dr. Jeff Stocker, Dr. James Hicks) team developed AIS receiver FPGA and processor algorithms and code
  - NRL team developed AIS receiver antennas, beam former, and RF Front End Unit, and provided final integration of components together
  - Environmental testing performed by NRL team for the space platform, as well as for airborne and ground testing
- Extensive (hundreds of flight hours) aircraft testing on various platforms in dense maritime environments
  - Southern CA
  - Mid-Atlantic East Coast (NY, NJ, Philadelphia)
- Receiver designed from the ground up to be built with government-owned intellectual property and without any classified algorithms or proprietary software



# AIS Receiver Design and Dynamic Range

FCC Licensed Power vs Frequency  
(Land Mobile, Maritime, Paging Databases July 2004)



- A challenge of the TIE AIS receiver design was to allow it to be useful in a very high dynamic range environments – identical hardware to be used onboard *both* aircraft and spacecraft
- Maximum signal level
  - -147 dBm range for a 400 km spacecraft
  - -50 dBm or higher for a terrestrial AIS receiver at very close range to the transmitter
- 100+ dB dynamic range is challenging to meet!





# Design Trades

- **Budgetary limitations but more importantly schedule drove severe design trades which limit performance but enabled meeting other programmatic requirements**
- **TIE implemented a simple RF Front End with a wide-bandwidth pre-selection filter**
  - **Custom designed filter would have provided better selectivity but was not obtainable in the schedule**
- **Adaptation of TACSAT-1 Copperfield-2 board set limited some receiver performance with some impact on sensitivity and digital filter performance**
- **A simple demodulator single-bit differential GMSK modulator was designed and utilized**
- **While a phased-array antenna approach was utilized and implemented, it was a basic design vice a fully-steerable electronic array**



# TIE AIS Receiver General Attributes



- **Designed to provide a platform for AIS signal collection, demodulation, and experimentation**
- **Software defined radio architecture**
  - **Digital filtering and cross-correlation functions happen within a field programmable gate array (FPGA) device**
  - **Demodulation of Gaussian minimum-shift keying (GMSK) waveform occurs within a general purpose processor**
  - **Output of the AIS receiver is “industry standard” NMEA-0183 message format within a container message format**
- **Store and forward architecture allows for autonomous data collection and archiving**
- **Ground processing architecture allows for receipt and processing of the spacecraft data to expose the original NMEA-0183 message format**



# Areas of AIS Receiver Experimentation

- The payload was specifically designed to be a platform for experimenting with the AIS signal
- Co-channel and/or adjacent channel interference investigations
  - Software-defined nature of the demodulator allows uploading new algorithms
  - Extensive on-board telemetry monitors every step in the demodulation process
  - Phased array antenna provides directivity
- Optimal antenna design experimentation
  - Omni-directional (coverage versus directivity)
  - Phased array for nulling high power emitters
  - Array orientation (wider coverage versus repeat)
- On-board processing and databasing
  - Reducing data rate requirements by filtering-onboard



# Phased Array Investigations

- During the initial design, we considered likely problems with co-channel interference from terrestrial sources and maritime sources
  - Self Organizing Time Domain Multiple Access (SOTDMA) networks see limited numbers of nodes around them versus a space node which sees far more
  - Terrestrial sources such as NOAA weather radio and other in-channel sources which are legally licensed but high-powered
- Limited front end filtering
  - Acquisition cost and schedule for a custom-designed filter were a driver
  - Practical challenges when a 4 kHz Doppler-induced error can be expected on the signal as it is received while maintaining narrow-band performance
- Given the “wing”-span of the solar arrays on the host spacecraft, a VHF phased array seemed like a workable area to experiment
  - 10 dB of gain and directivity
  - Reduce the effective instantaneous field of view
  - Spacecraft motion would compensate for limited instantaneous view by providing robust coverage





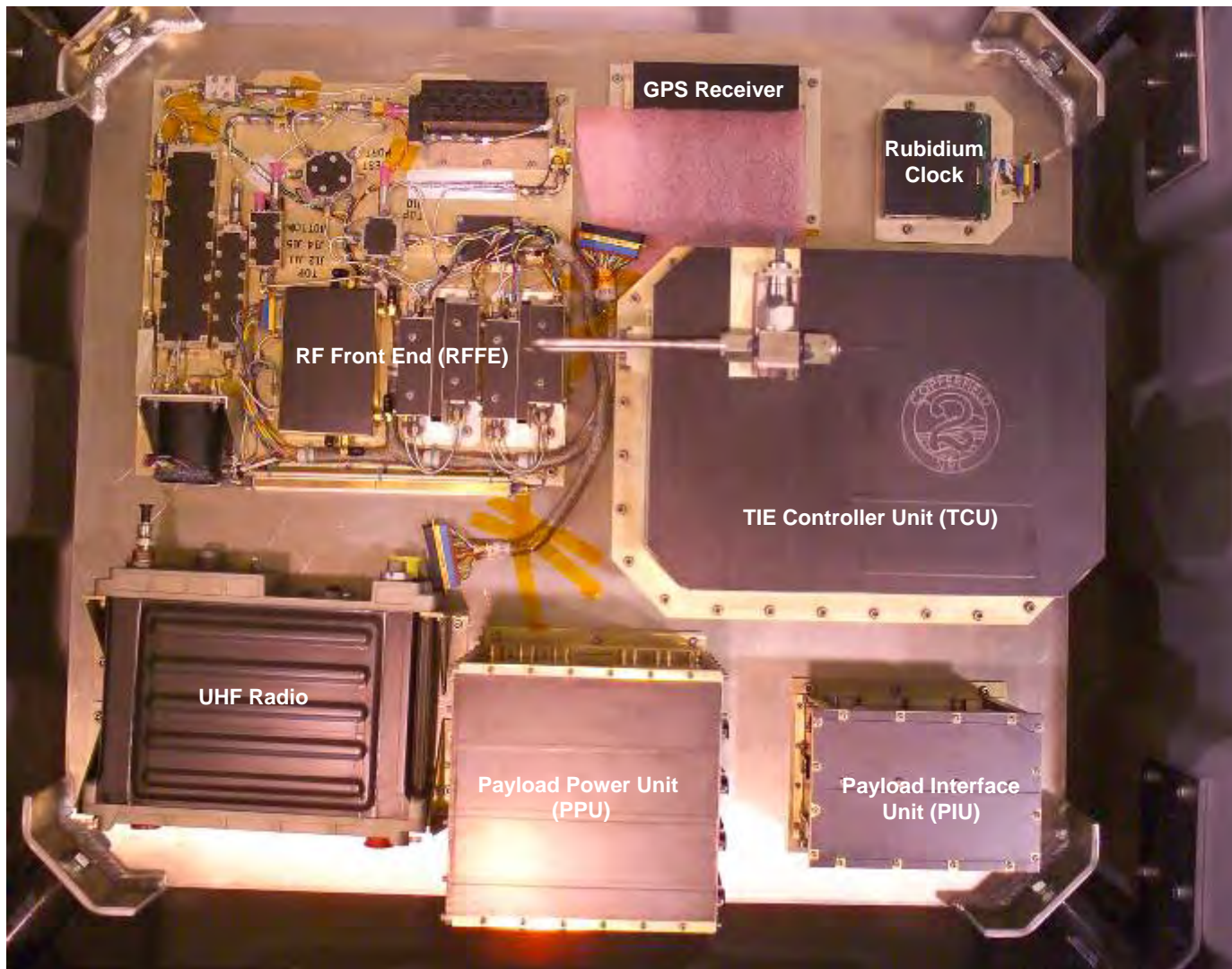
# TIE AIS Receiver Software Message Filter Capabilities



- **Two-Channel Receiver**
- **Live Data Streaming**
  - AIS1 and AIS2 Channel Messages Streamed Live in Default Mode
  - All AIS Messages Archived Into Internal Database (Reset at Each Power Cycling)
  - Parametric Data Augments Each Message
    - Time-of-Intercept
    - Additional message characterization
  - Distance from Receiver Platform to Vessel-reported Position can be Calculated
- **Live and Archived Data Filtering**
  - AIS Messages can be Filtered by one or more of:
    - Message Type (Type 1, 2, or 3 Position Reports; Type 5 Ship Static and Voyage-related Data)
    - MMSI or IMO (regular expression)
    - Navigation Status (regular expression)
    - Cargo Type (regular expression)
    - Latitude and Longitude (Min/Max)
    - Speed-Over-Ground (Min/Max)
    - Time-of-Intercept (Min/Max)



# TIE Equipment Suite: Pre-Ship





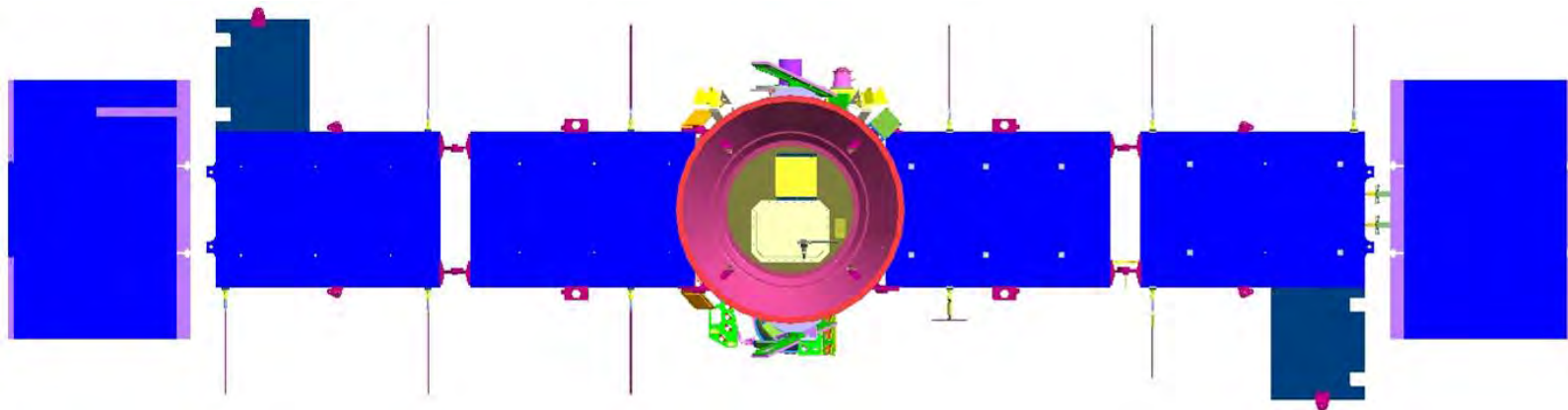
# TACSAT-2 General Attributes



- **Launched December 16<sup>th</sup>, 2006 on a Minotaur-I launch vehicle from Wallops Space Flight Facility, VA**
- **420 kilometer Low Earth Orbit (LEO) satellite at about 40 degrees inclination**
- **About ten other experiments onboard the spacecraft with competing demands for power, pointing and downlink bandwidth**



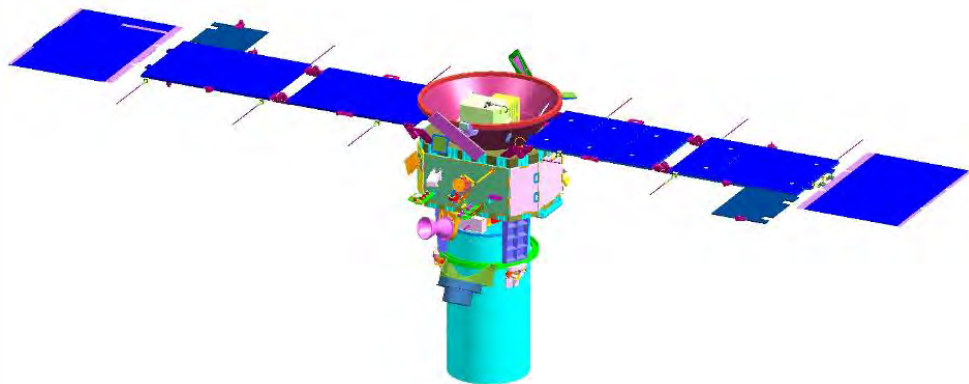
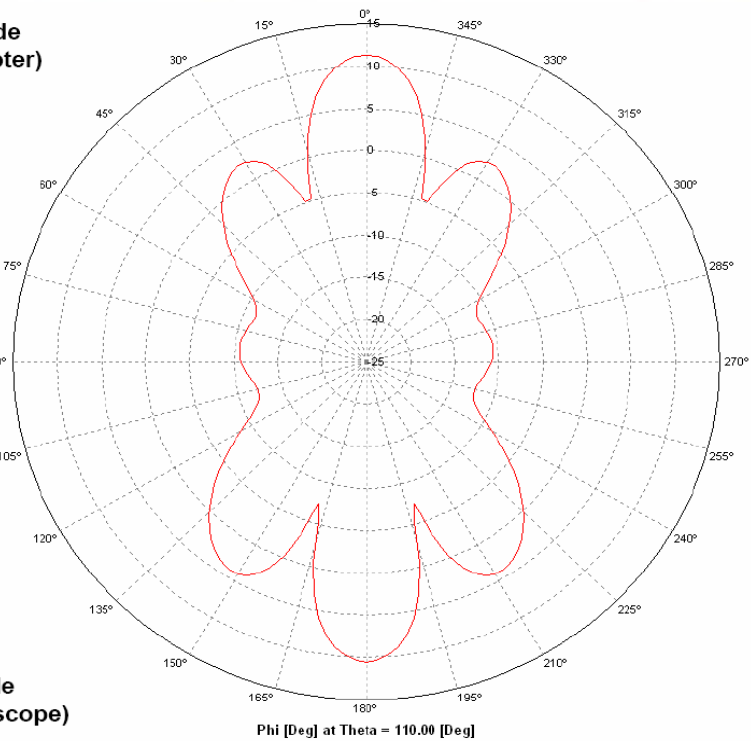
# TACSAT-2 Spacecraft



+X side  
(Adapter)



-X side  
(Telescope)



I



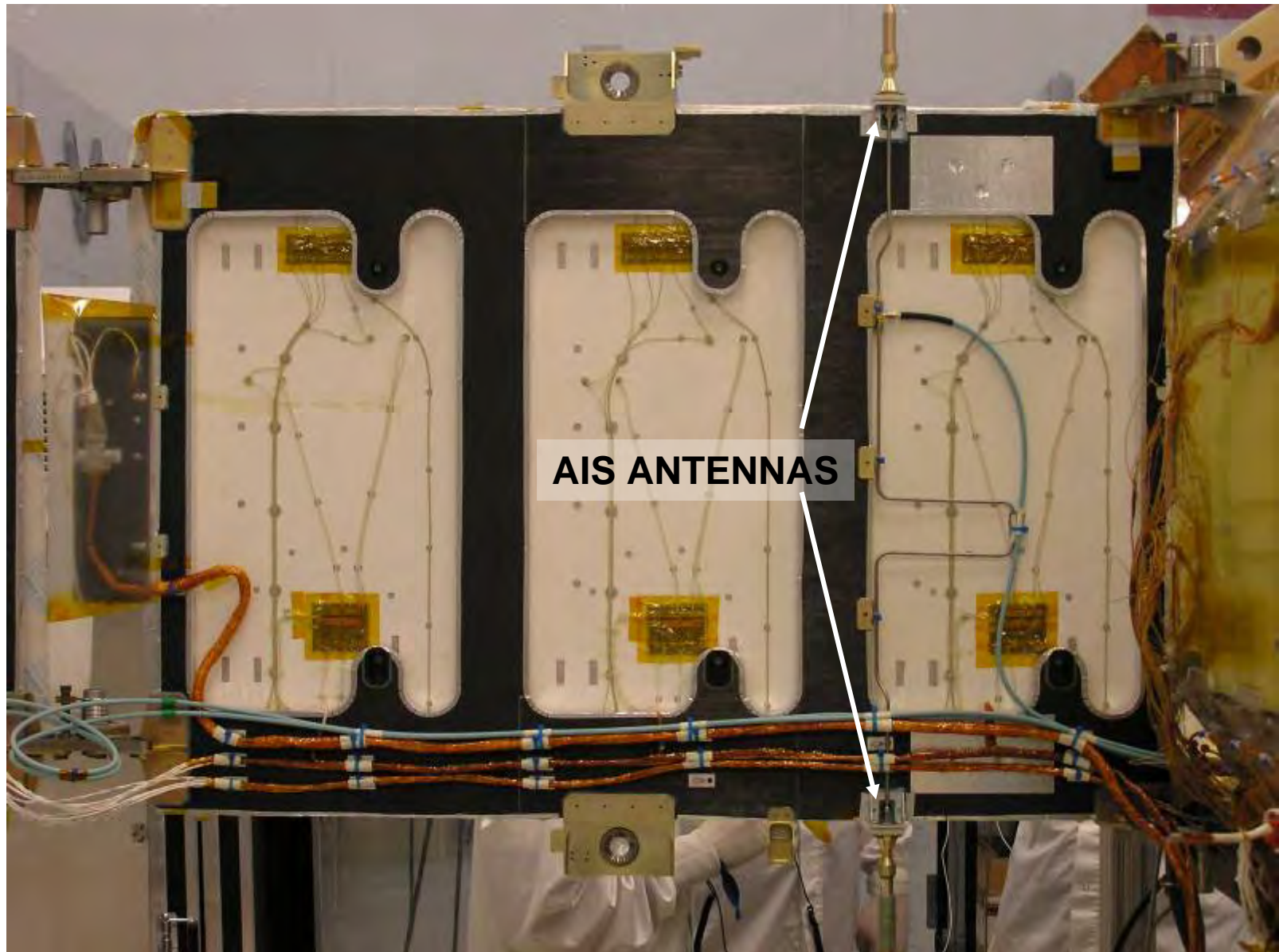


# Antenna Installation on TS-2 Spacecraft





## Close-Up of TIE AIS Antennas Installed on Solar Array Panels

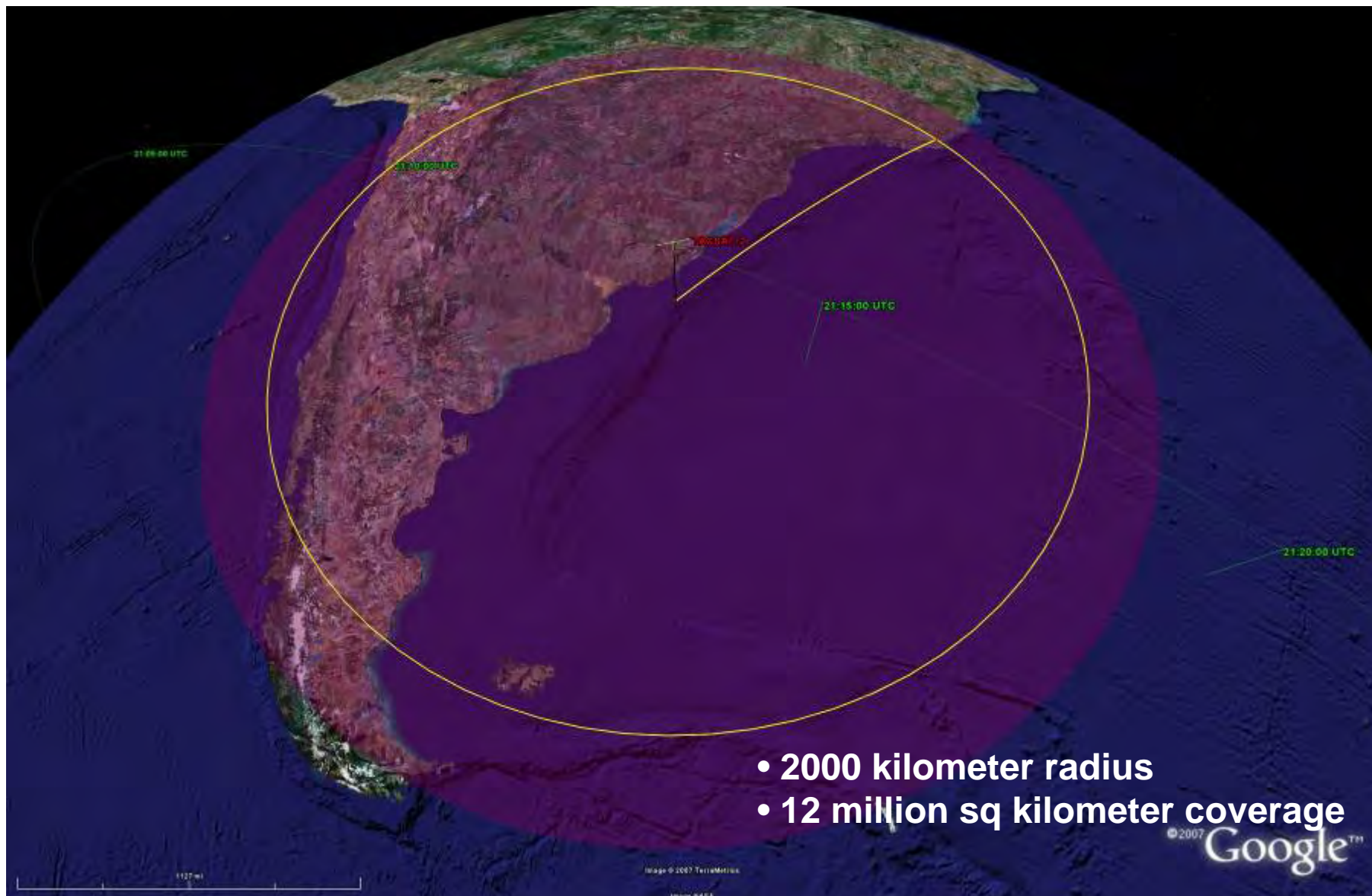


**AIS ANTENNAS**



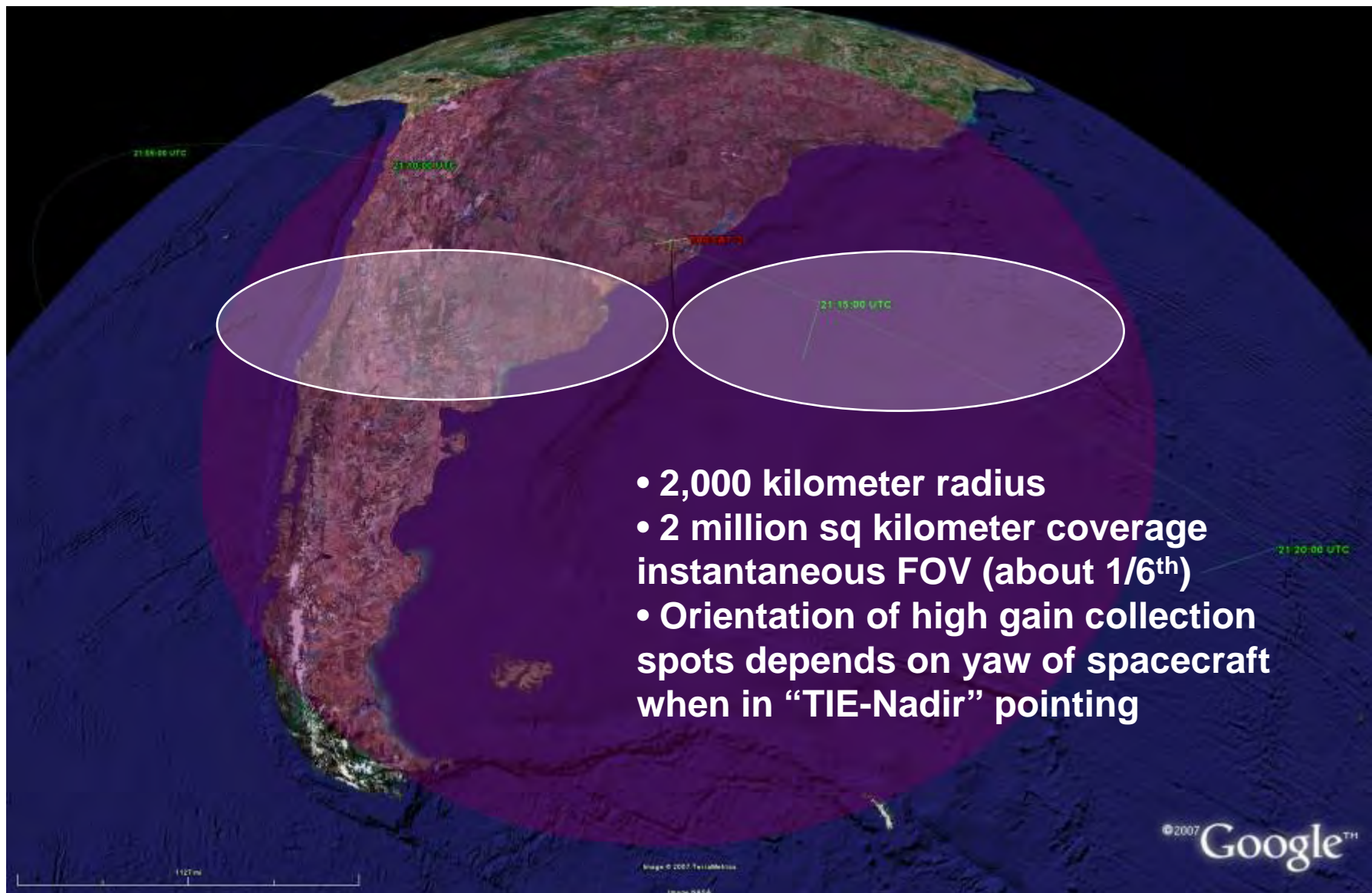


# Earth Coverage of TACSAT-2





# Earth Coverage of TACSAT-2 with Phased Array Antenna Pattern

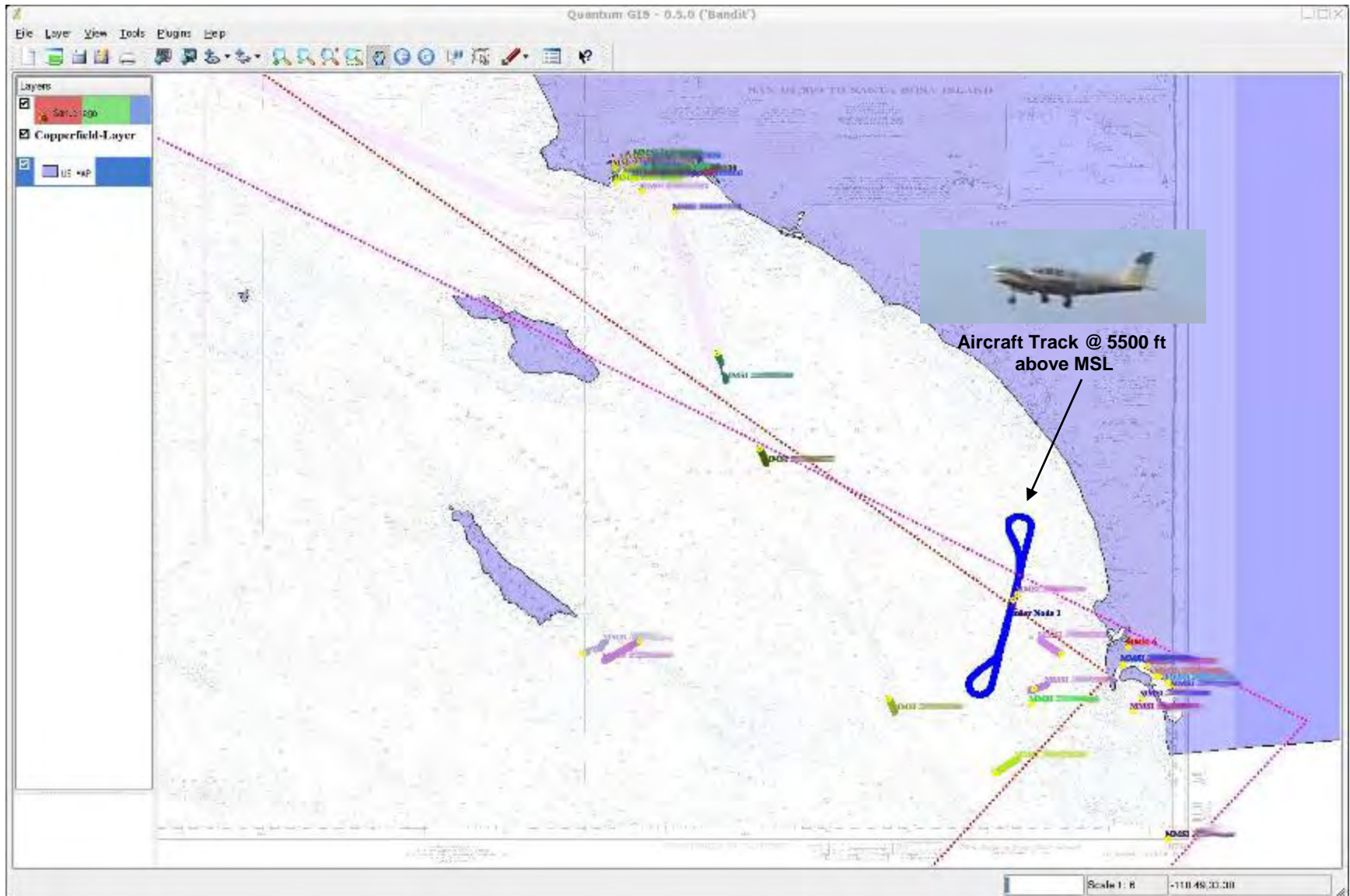


©2007 Google™





# Airborne AIS Testing





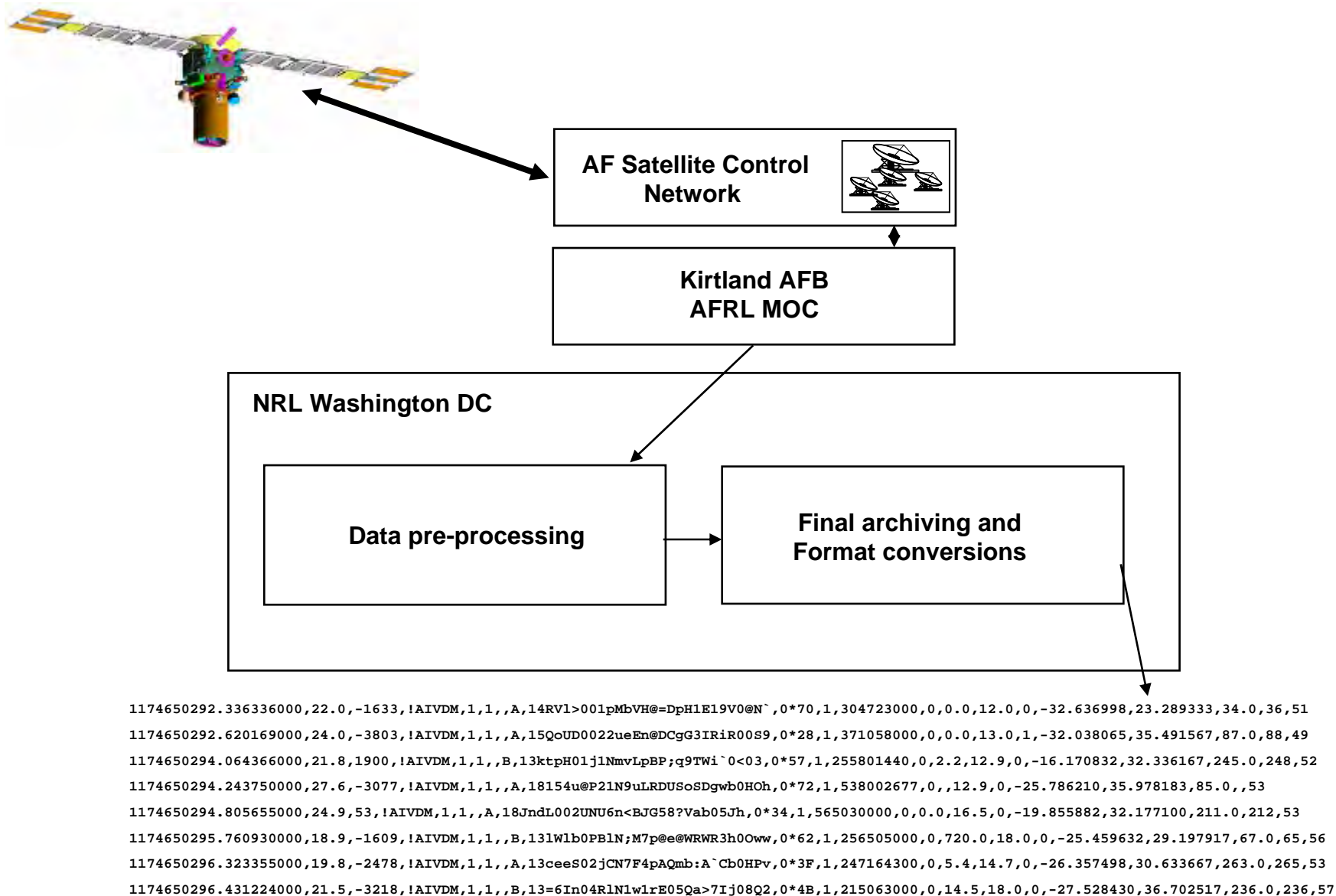
# TIE Authorities and Legal Issues



- While launched in mid-December, 2006, the spacecraft had challenges that prevented its use to experimenters until mid-January 2007
- Legal concerns were raised by the intelligence community (IC) in late January 2007 that had to be addressed before major experimentation could begin
- April 2007, permission was given to start operating TIE in a limited fashion restricting the use of its data for test and checkout purposes
- Finally, in September 2007, agreements and authorities allow TIE data to be used by limited US Government (USG) entities starting with the US Navy and US Coast Guard for the purposes of Homeland Defense and Maritime Domain Awareness applications
- October 2007 -- Data-sharing plans are under review and will allow use of TIE data first with DoD and USCG entities, possibly others later



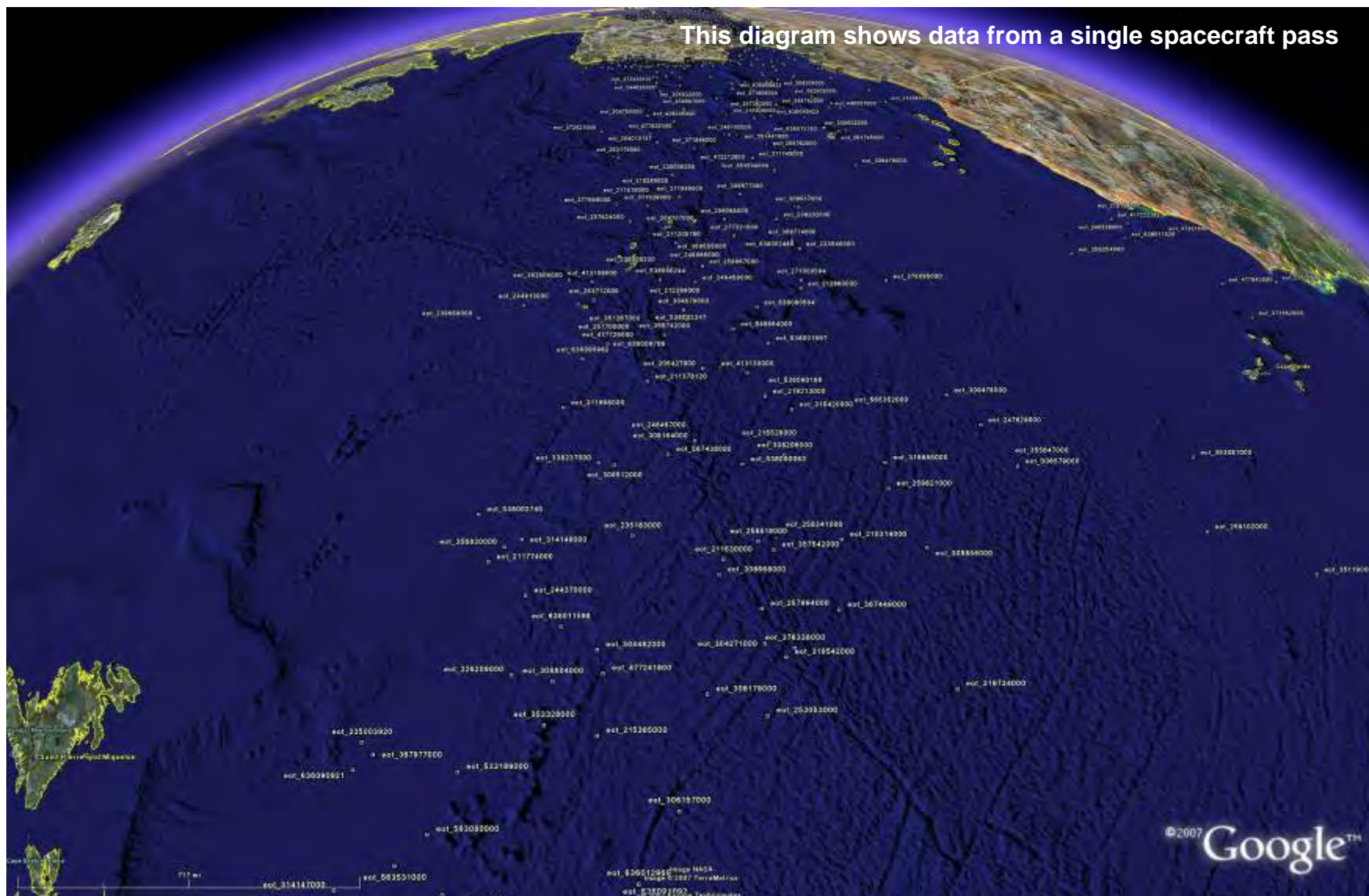
# Top Level Data Flow





# View over the Mid-Atlantic

This diagram shows data from a single spacecraft pass







# Spain, Portugal, Gibraltar

This diagram shows data from a single spacecraft pass

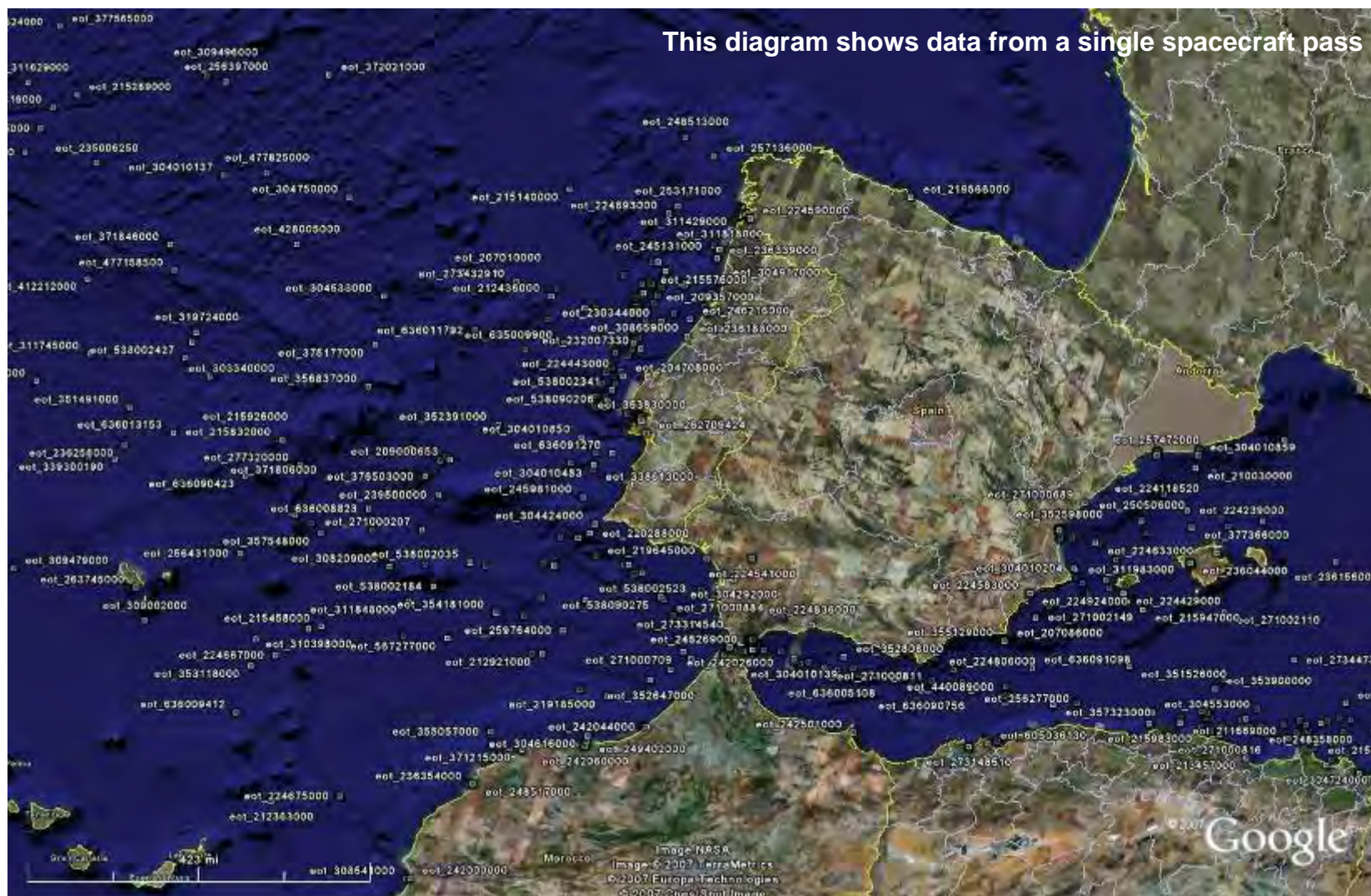
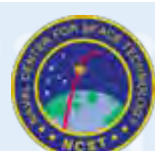


Image: NASA  
Image: 6-2007, Image: Meteo, cs  
© 2007 Europa Technology  
© 2007 Google/Spot Image





# Mid-East

This diagram shows data from a multiple spacecraft passes

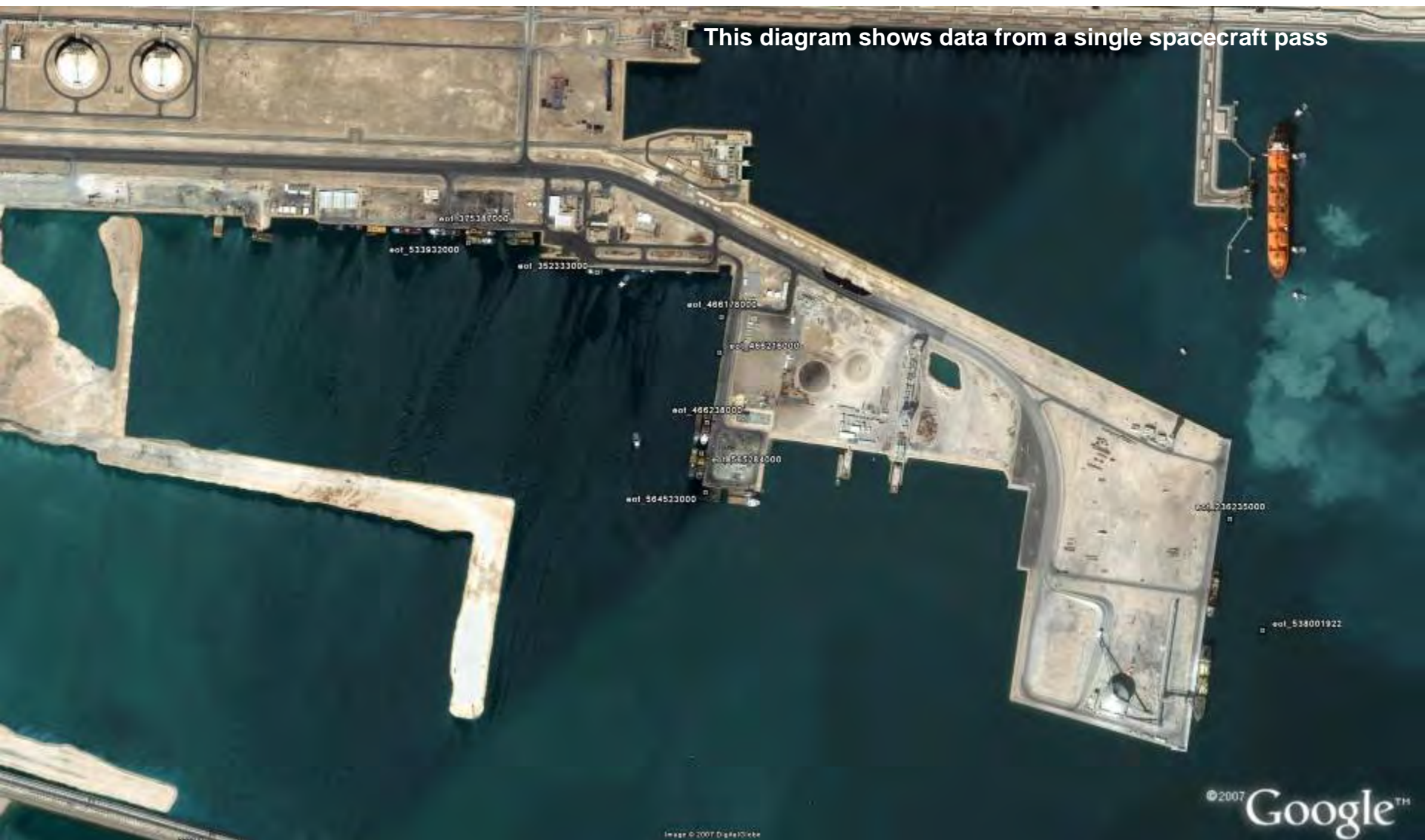






# Oil Terminal

This diagram shows data from a single spacecraft pass

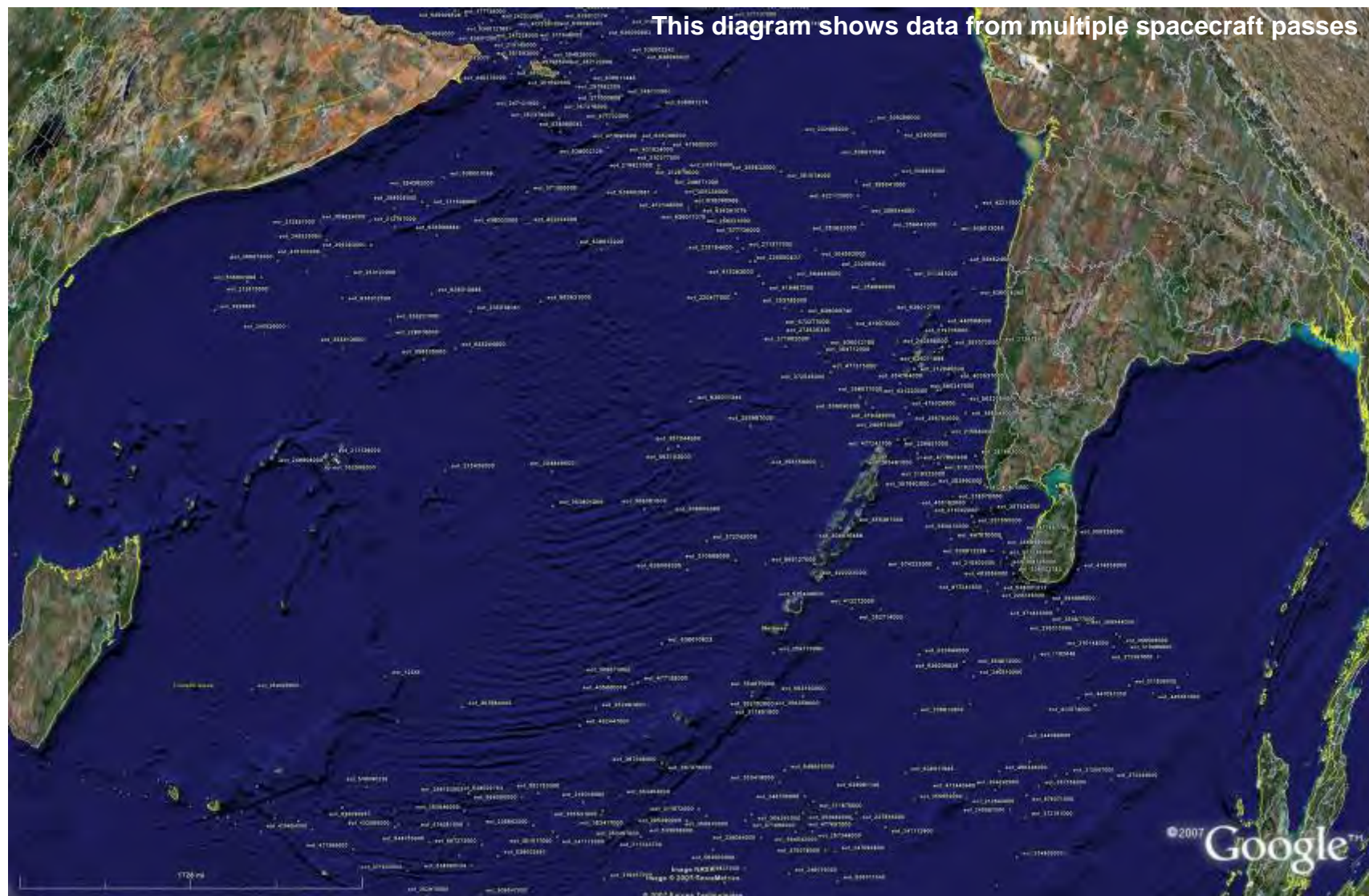


© 2007 Google™

Image © 2007 DigitalGlobe



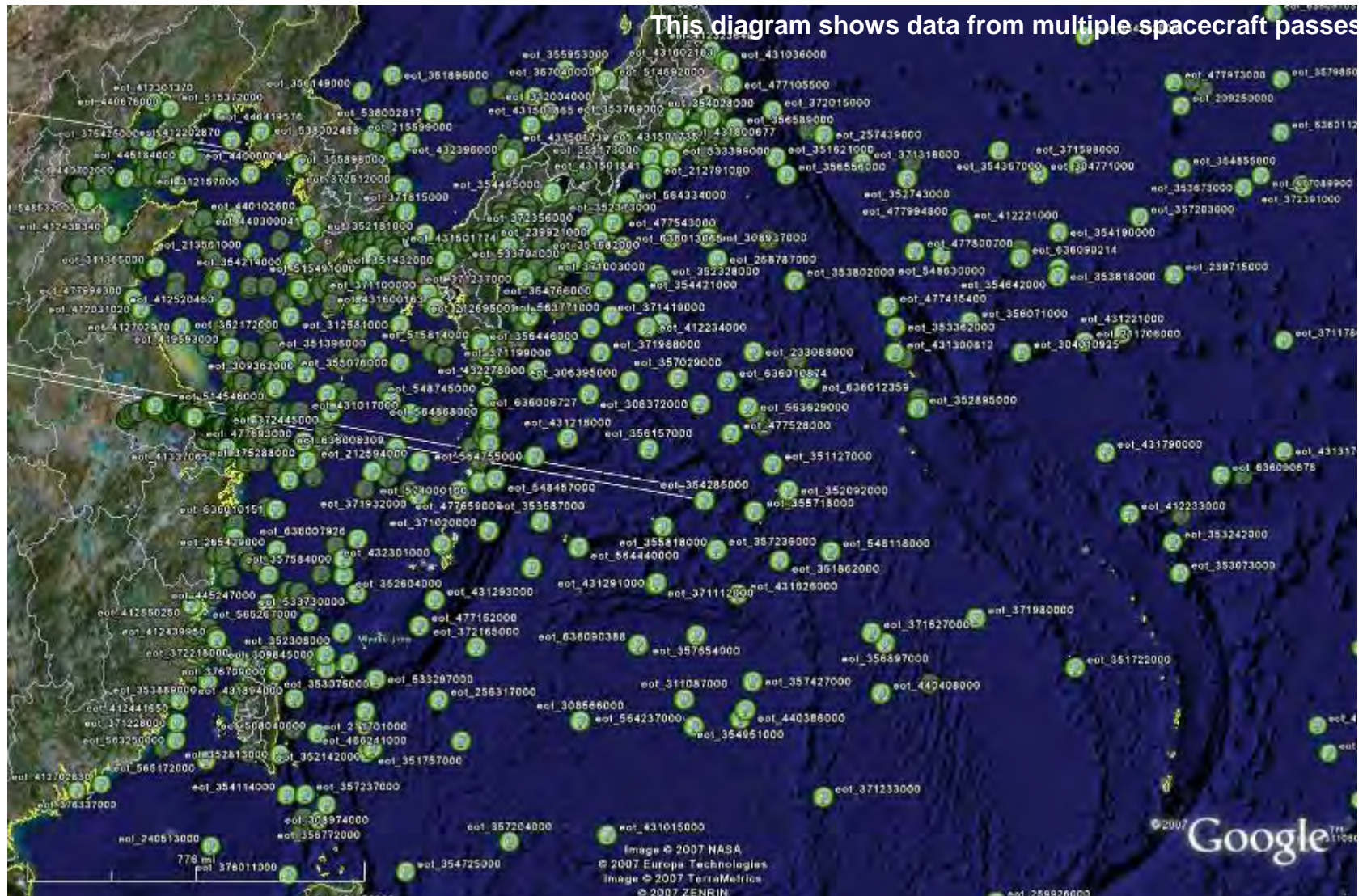
# Indian Ocean







# South China Sea/Sea of Japan







# Africa





## Way Ahead

- **TACSAT-2 entered “extended operations” 1 October 2007 with primary goals to continue AIS testing**
- **Experimentation continues**
  - **Antenna array orientation testing**
  - **“6-parameter” testing**
  - **Calibration and received signal level testing**
- **Fate of TACSAT-2 after December 31, 2007 not yet known, possibility for extended operations**
- **Continued efforts to clear the path for data sharing at USG level first, but also considering other partners**
- **AIS receiver development and experimentation will continue on at NRL through TACSAT-2, and other current and on the horizon efforts**



# Acquisition Directorate

---

## Nationwide Automatic Identification System Project

# The USCG Nationwide AIS Project

CG-939 | CDR Keith Ingalsbe

Maritime Domain Awareness Day | 29 Oct 2007





# Agenda

---

- **Mission Need**
  - Maritime Security
  - Maritime Safety and Mobility
- **AIS - The Core of NAIS**
  - What is AIS (a Technology and a Standard)
  - How AIS Works
  - What Information AIS Provides
- **NAIS Project Description and Status**
  - Increment 1 – AIS Receive In Critical Ports and Coastal Areas
  - Increment 2 – AIS Receive and Transmit Nationwide
  - Increment 3 – Long-Range AIS Receive

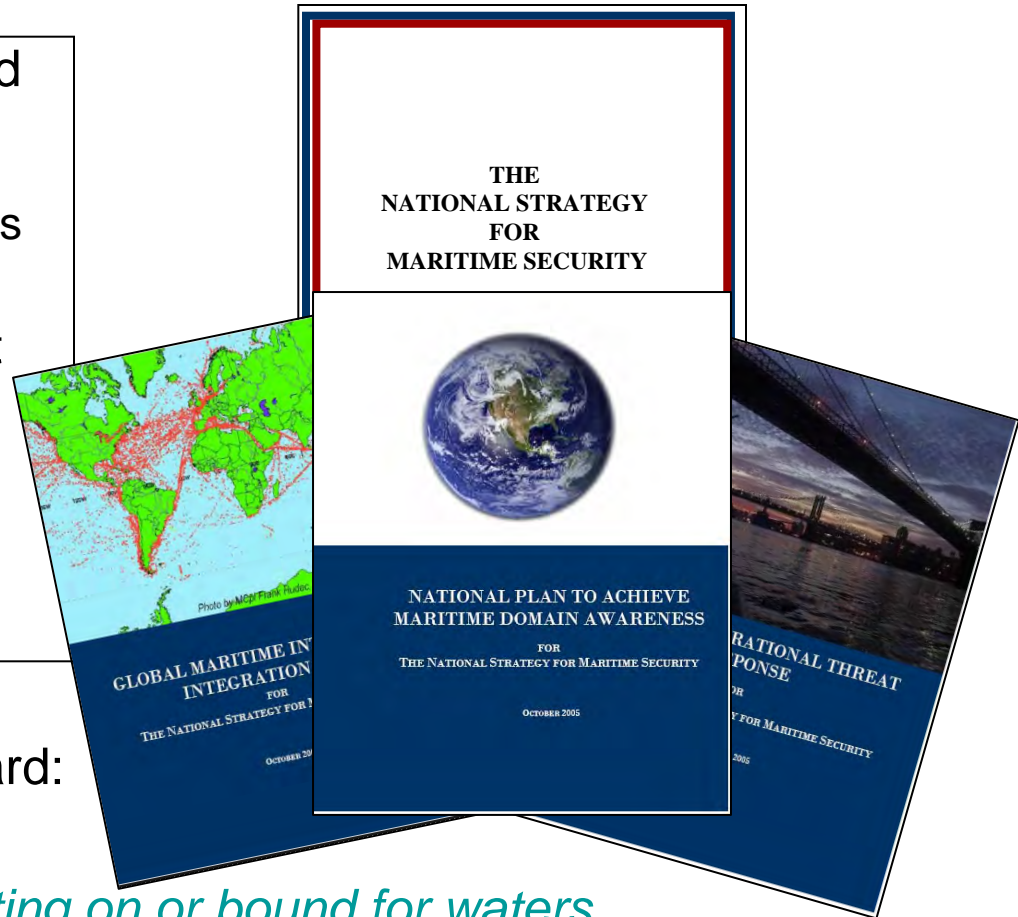
# Mission Need

## Maritime Security - The Impetus for NAIS

- U.S. Coast Guard (USCG) is the lead federal agency for U.S. Maritime Security
  - Protecting approximately 95,000 miles of America's maritime borders
- Maritime Transportation Security Act (MTSA) of 2002
  - Automatic Identification System (AIS) carriage
  - Direction to USCG on carrying out Maritime and Homeland Security

- The MTSA directs the U.S. Coast Guard:

*“to collect, integrate, and analyze information concerning vessels operating on or bound for waters subject to the jurisdiction of the United States, including information related to crew, passengers, cargo, and intermodal shipments.”*



# Maritime Safety and Mobility and Protection of Natural Resources

Leveraging the full functionality of AIS to enhance USCG preparedness for risks in the maritime environment and mission performance:

- Infrastructure and system for data communications between shore and vessels
- Tracking of and secure communications with government vessels
- Ability to manage AIS operations to preserve primacy of navigational safety



*Ready Today...Preparing for Tomorrow*

# Maritime Domain Awareness

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## MDA Defined as:

“...the effective understanding of anything associated with the global maritime domain that could impact the security, safety, economy, or environment of the United States.” – *National Plan to Achieve Maritime Domain Awareness*



# Enhancements of Other USCG Missions

- Maritime/Navigation Safety & Mobility
  - Vessel Traffic Management
  - Aids to Navigation
  - Domestic Icebreaking
- Search and Rescue Operations
- Maritime Incident Investigation
  - Collisions, allisions & groundings
  - Environmental incidents
- Vessel Inspection Program

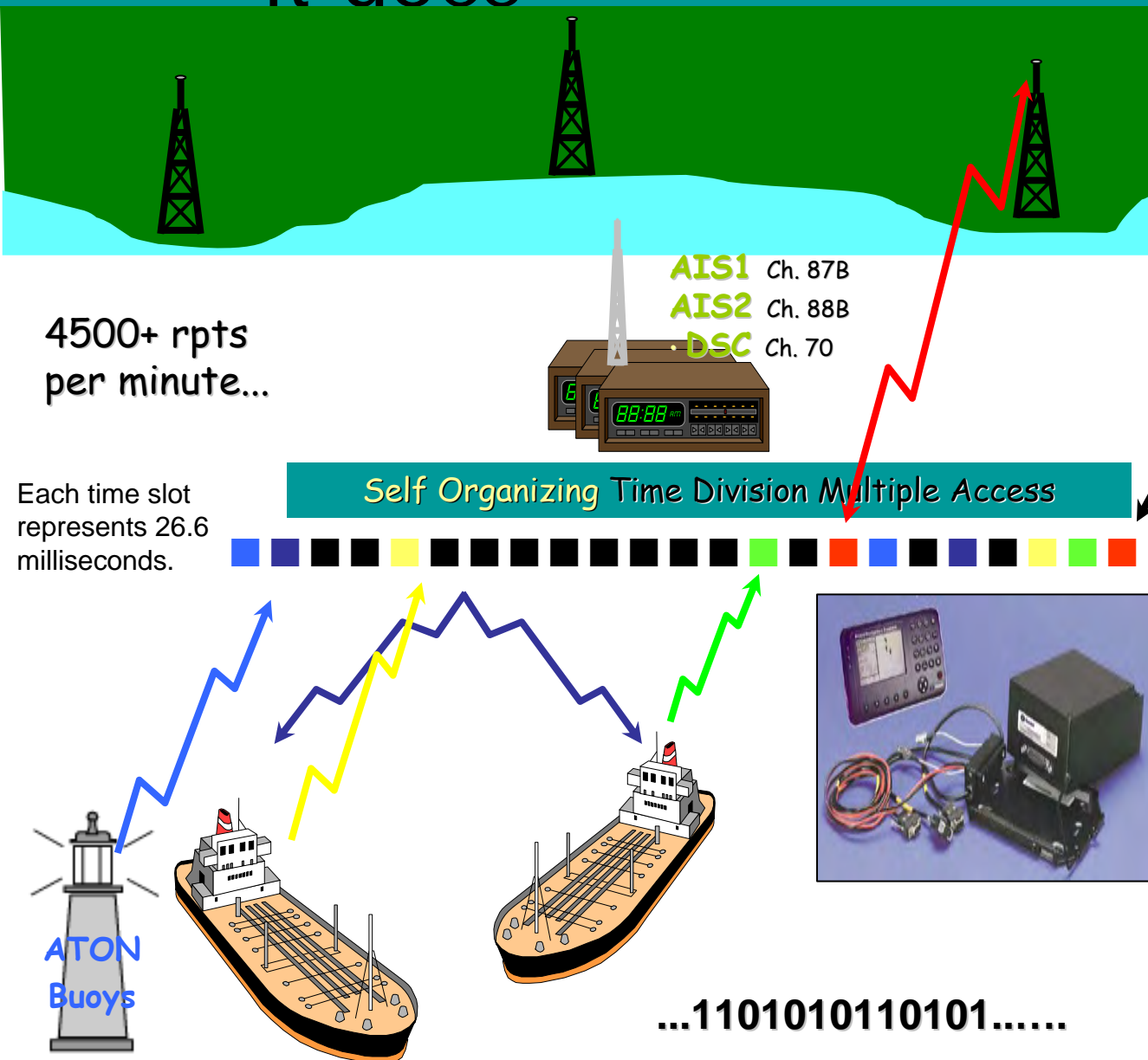


# AIS - The “Core” of NAIS

Originally conceived by international community for navigation safety...AIS is both:

- A Standard –
  - For communicating maritime navigation safety and security information
  - Internationally adopted as a requirement of vessels covered by the Safety of Life at Sea Convention (SOLAS)
- A Technology –
  - Shipboard broadcast system that acts like a transponder
  - Operates in the Very High Frequency (VHF) maritime band – “line of sight”
  - Permits the voiceless exchange of information between AIS-equipped vessels and shore-side stations
  - Information is continually and automatically updated in near real-time and received by all AIS-equipped ships and shore stations in its vicinity

# AIS – how it works and what it does



## *Dynamic (2-10 sec)*

- MMSI / IMO#
- POSITION
- ACCURACY (+/-10m)
- UTC
- COURSE (COG)
- SPEED (SOG)
- HEADING
- NAV STATUS
- RATE OF TURN

## *Static (6 min.)*

- VESSEL NAME
- CALL SIGN
- LENGTH / BEAM
- TYPE OF SHIP
- ANTENNA LOCATION

## *Voyage Related*

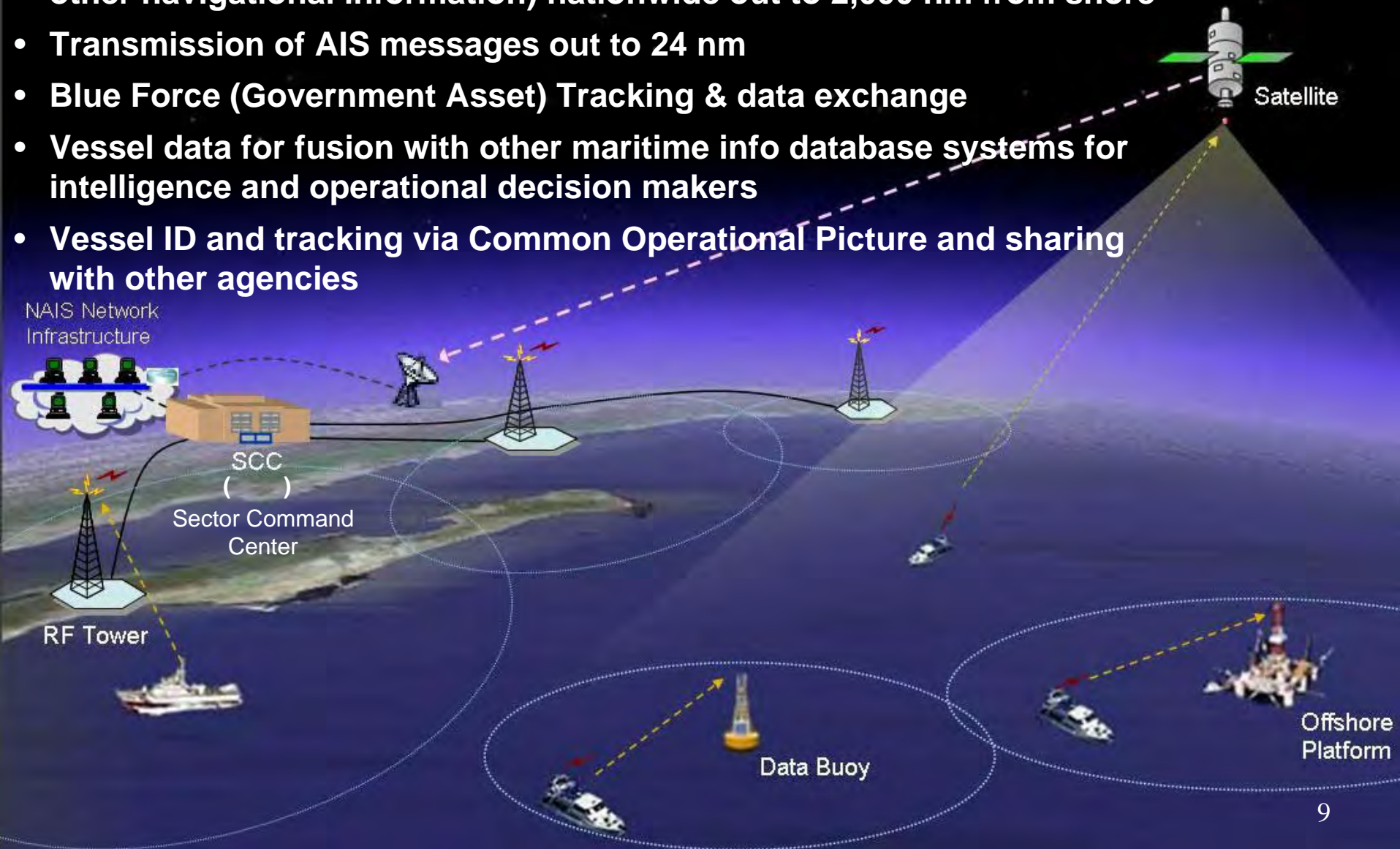
- DRAFT
- HAZ CARGO ONBOARD
- ETA / DESTINATION
- ROUTE PLAN

## *Safety Related*

- SHORT TEXT MESSAGES

# NAIS Services – What you get

- Automatic reception of AIS information (vessel ID, location, speed, & other navigational information) nationwide out to 2,000 nm from shore
- Transmission of AIS messages out to 24 nm
- Blue Force (Government Asset) Tracking & data exchange
- Vessel data for fusion with other maritime info database systems for intelligence and operational decision makers
- Vessel ID and tracking via Common Operational Picture and sharing with other agencies





# NAIS Acquisition - 3 Increments

## I-1 Receive Only in Critical Ports

- Partnership w/ Naval Sea Logistics Center:
- Validated government design
- Purchased and installed AIS receive-only equipment at USCG designated sites
- Designed and implemented integrated support

## I-1 Ongoing...transitioning to sustainment

Increment 1 design and performance/support data provided as Government Furnished Information for Increment 2.

### Summary :

- Multiple contracts, Military Interdepartmental Purchase Requests (MIPRs) & Memorandums of Agreement (MOAs) to balance need for:
- Interoperability
- Leveraging existing Government infrastructure and expertise
- Competition
- Best technical solutions and minimizing reliance on proprietary systems

## I-2 Nationwide Coverage w/ Transmit & Receive

- Best Value, Trade-off, Full & Open Competition
- Design, implement and test
- Receive/transmit, data processing & interoperability
- Full system integration
- System support as determined by Integrated Logistics Support Plan

## I-3 Long-range Receive:

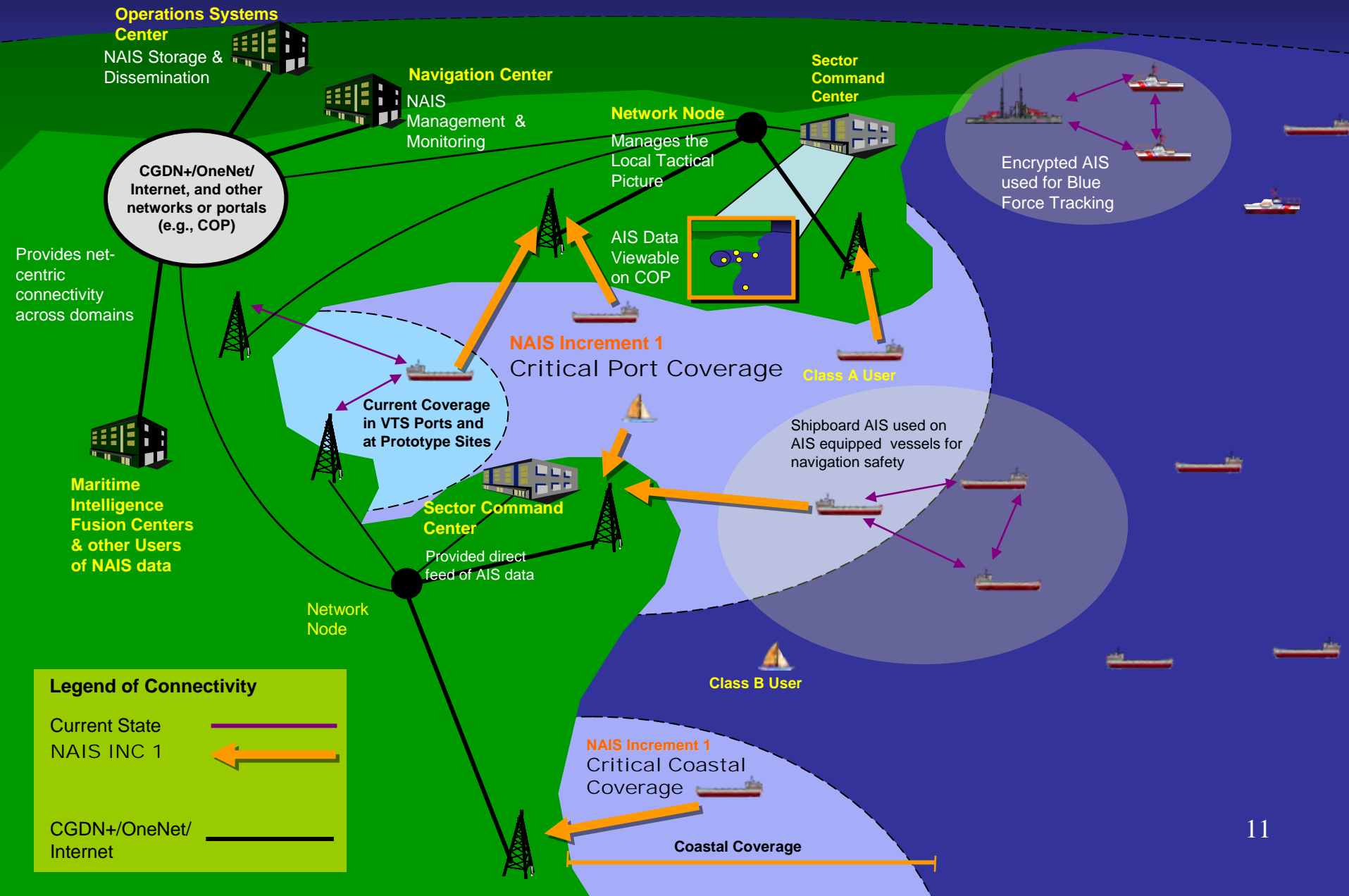
- Service Contract to satellite provider
- Contract for AIS on offshore platforms
- MIPR to National Data Buoy Center for AIS on data buoys
- System support to be included in each contract

## Backbone For All Increments

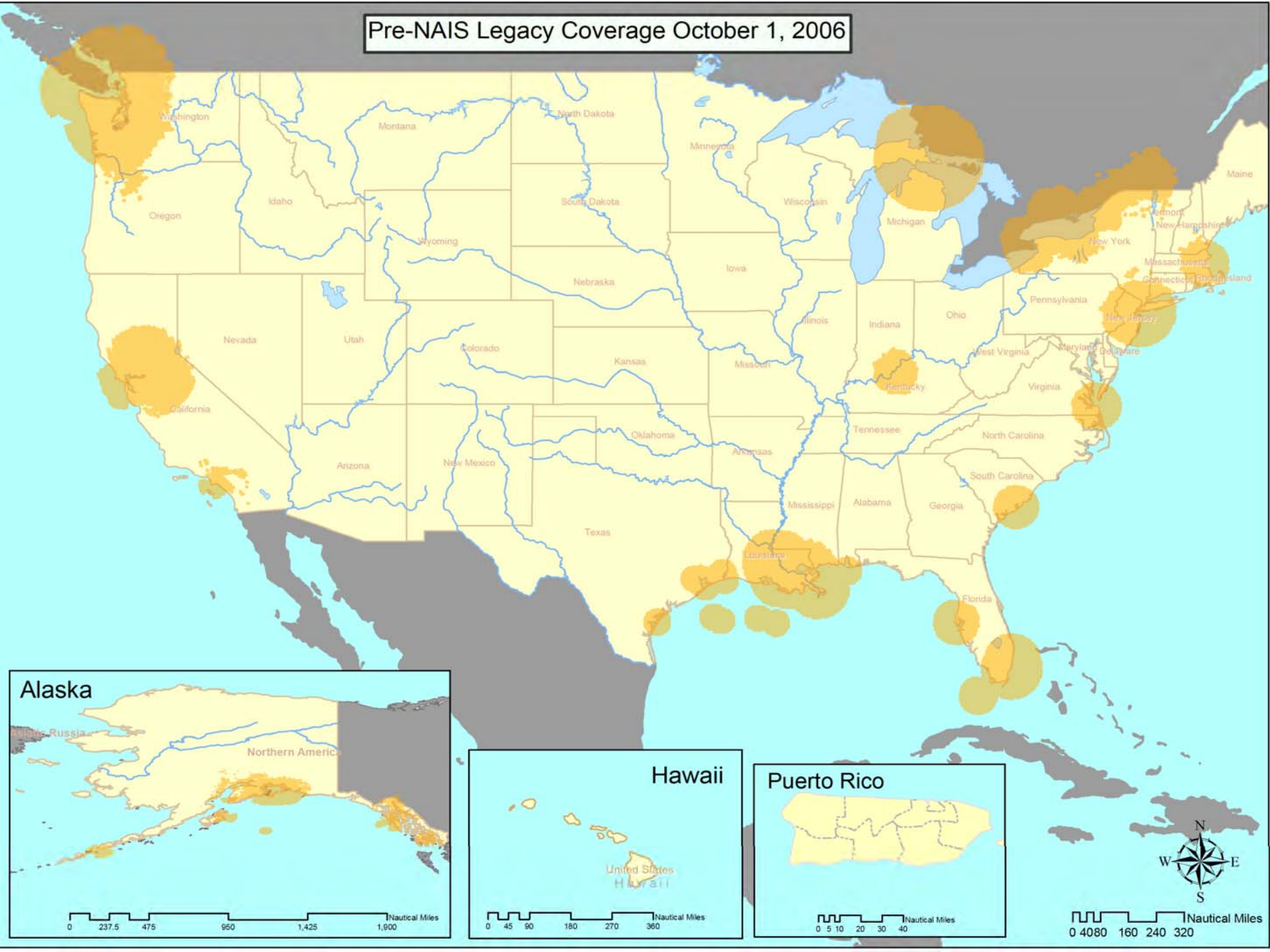
Telecommunication and Information Systems Command (TISCOM) Connectivity Services (CGDN+/DHS OneNet)  
Operations Systems Center (OSC) for Enterprise Data Warehouse Services  
Navigation Center (NAVCEN) for System Operations Center Services

# Nationwide AIS Operational View 1

## Increment 1 – Receive Only in 55 Critical Ports + 9 Coastal Areas

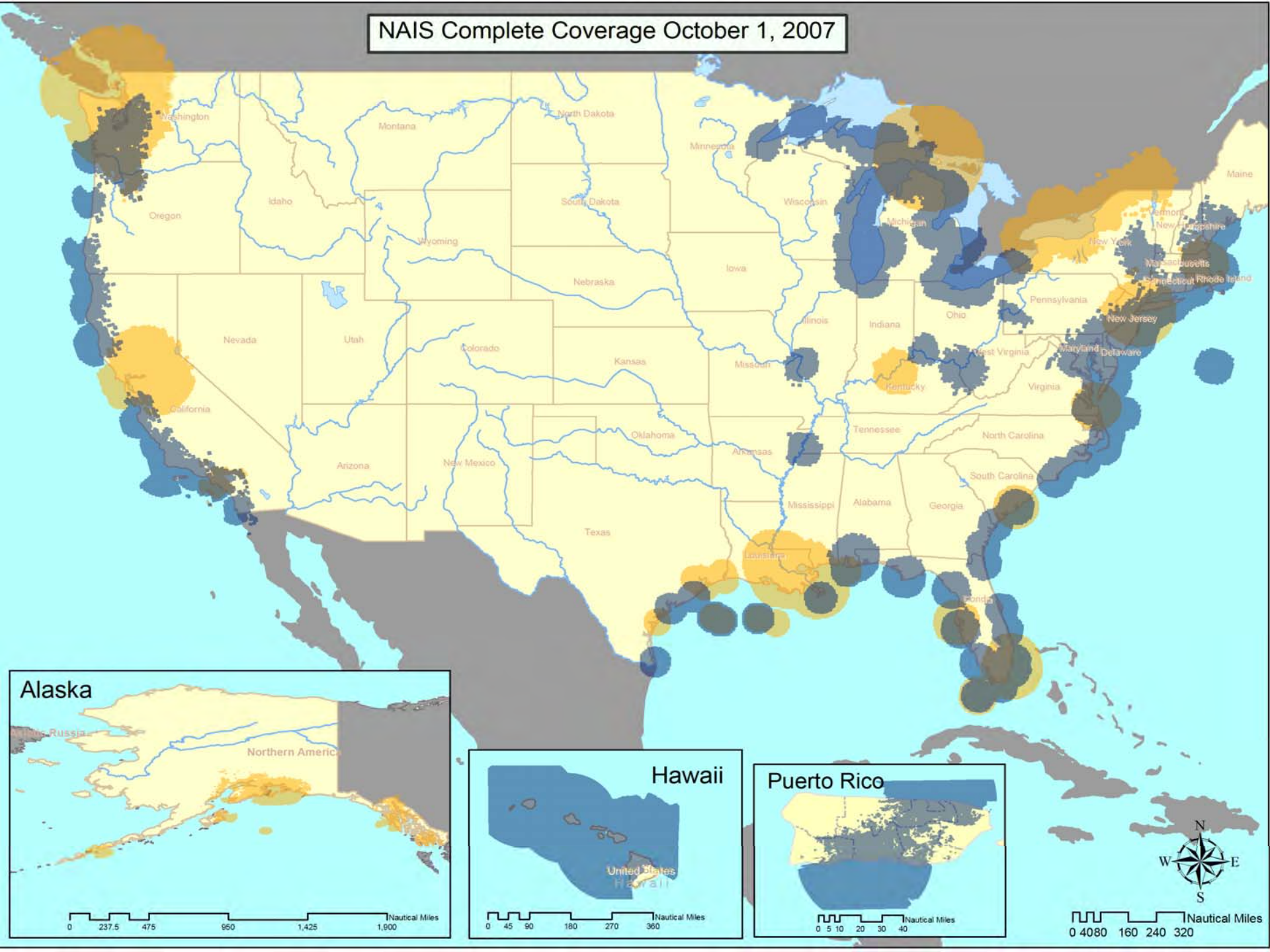


# Pre-NAIS Legacy Coverage October 1, 2006





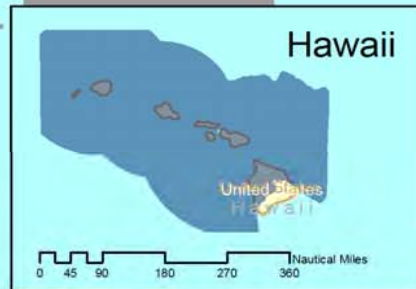
# NAIS Complete Coverage October 1, 2007



## Alaska



## Hawaii



## Puerto Rico

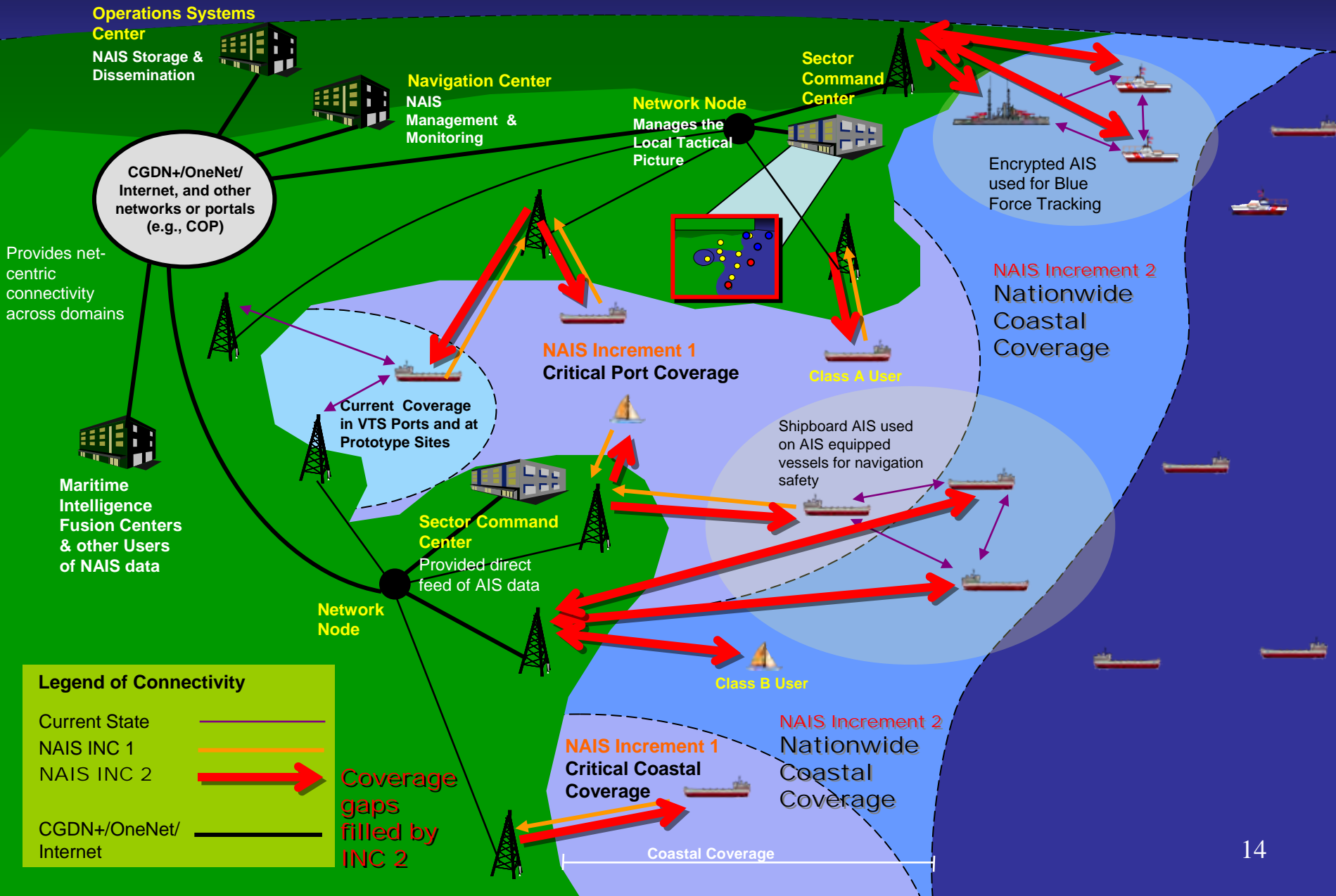




# Nationwide AIS Operational View 1

## Increment 2 –Transmit + Receive Nationwide

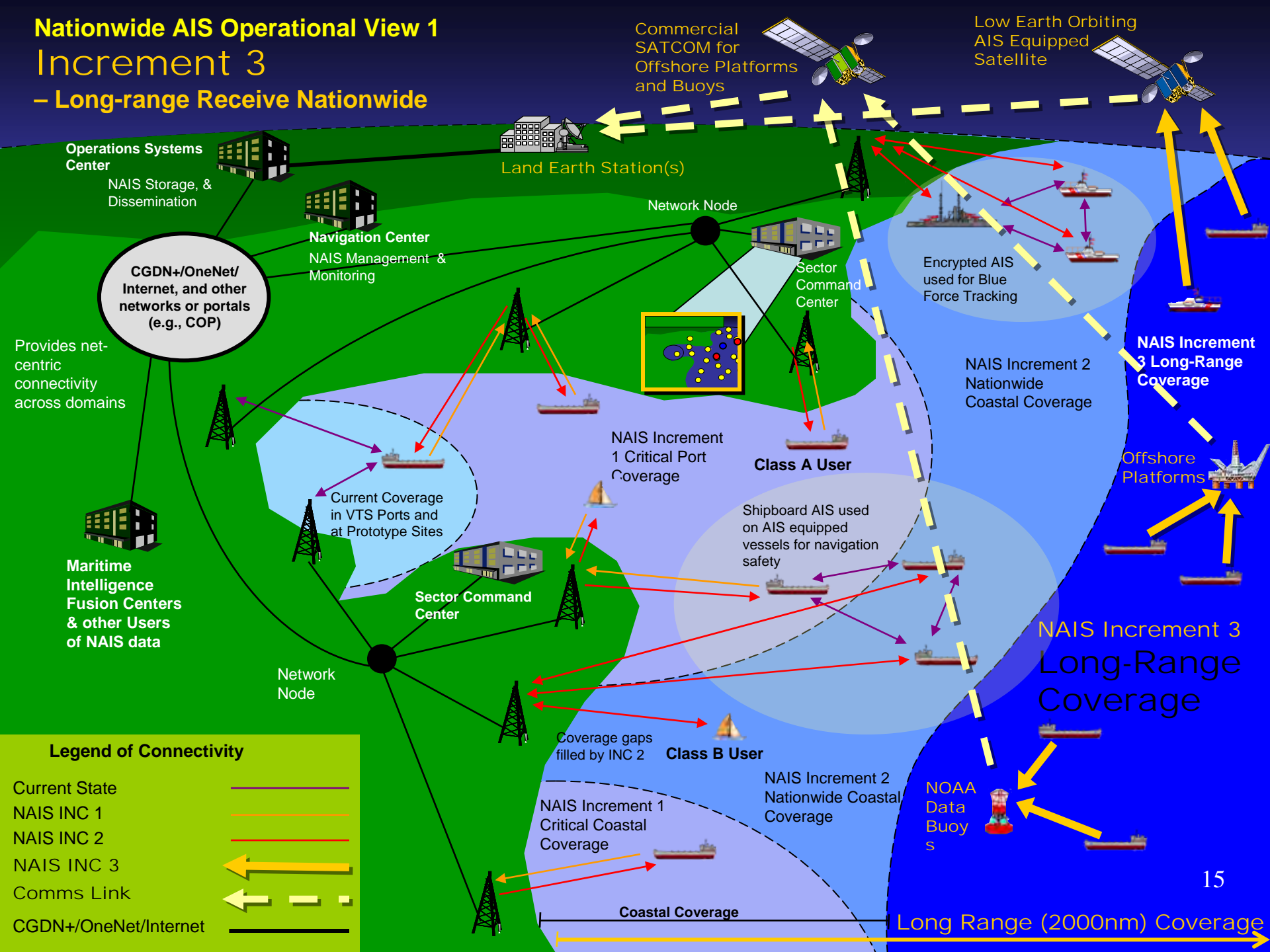
NAIS provides data link for asset tracking and information exchange



# Nationwide AIS Operational View 1

## Increment 3

### - Long-range Receive Nationwide



# Near-Term Events

---

- Increment 1:
  - Sponsor's Assessment of OT&E
  - Complete transition to sustainment
- Increment 2:
  - Release I-2 Phase I RFP (Nov '07)
  - Award Contract (4<sup>th</sup> Qtr FY08)
- Increment 3:
  - Proof of Concept Satellite Launch (Dec '07)
  - Satellite and Weather Buoy Concept Testing Report (3<sup>rd</sup> Qtr FY08)

# Key Contacts & Information Links

**CDR Keith Ingalsbe**

Project Manager

202.475.3120

**Gene Lockhart**

Deputy Project Manager

202.475.3144

**Kerri Williams**

Contracting Officer

202.475.3192

## Other Resources:

NAIS Project Website: [www.uscg.mil/nais](http://www.uscg.mil/nais)

NAIS I-2 RFP Development Website: [www.naisproject.net](http://www.naisproject.net)

USCG NAVCEN Website: <http://www.navcen.uscg.gov>



Questions ?





# Leading Change from the Middle 2001-2007



“Any commander who fails to exceed his authority is not of much use to his subordinates.”

ADM Arleigh Burke



# Leading Change from the Middle

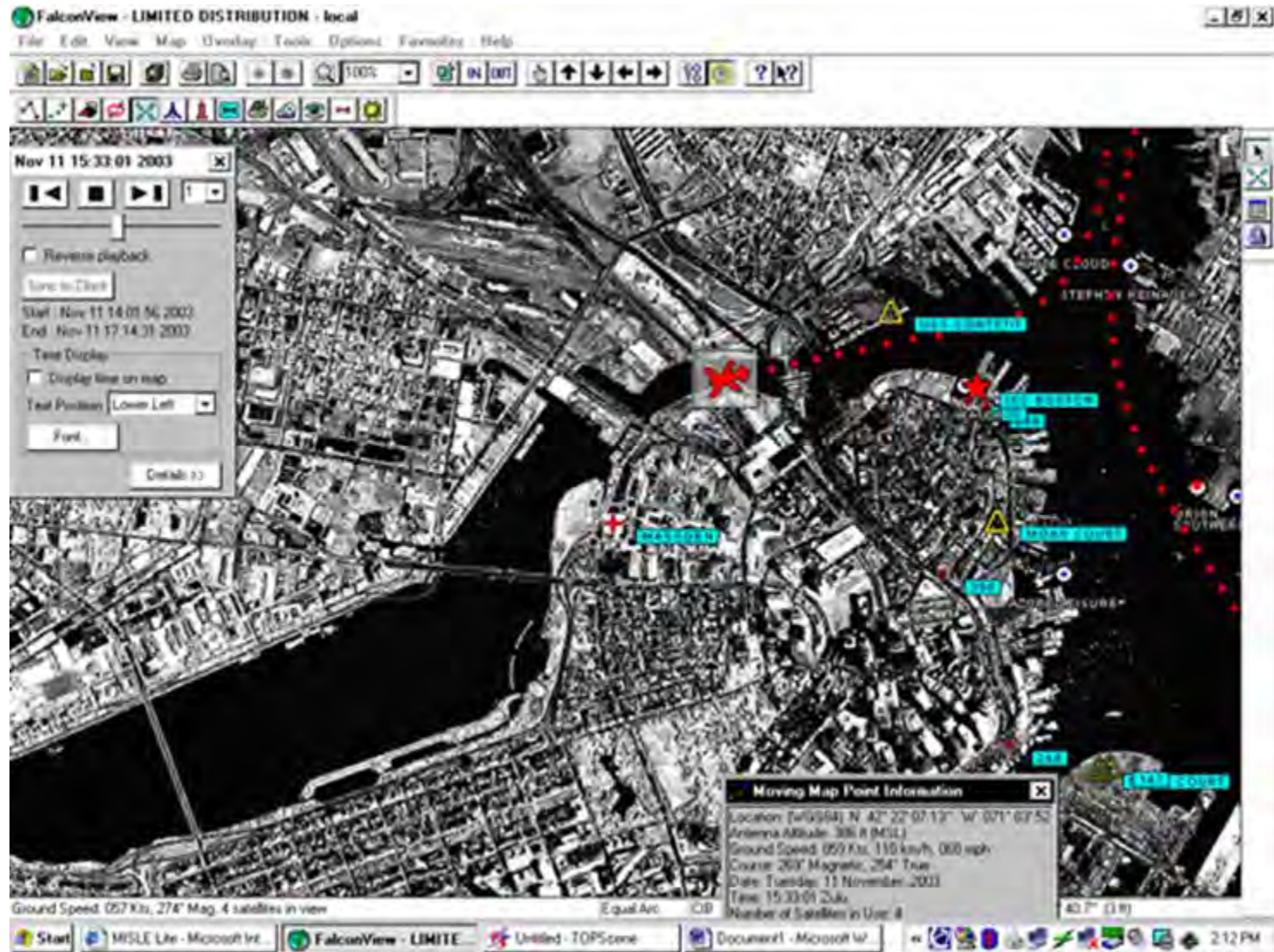
- What did we help accomplish?



# Leading Change from the Middle

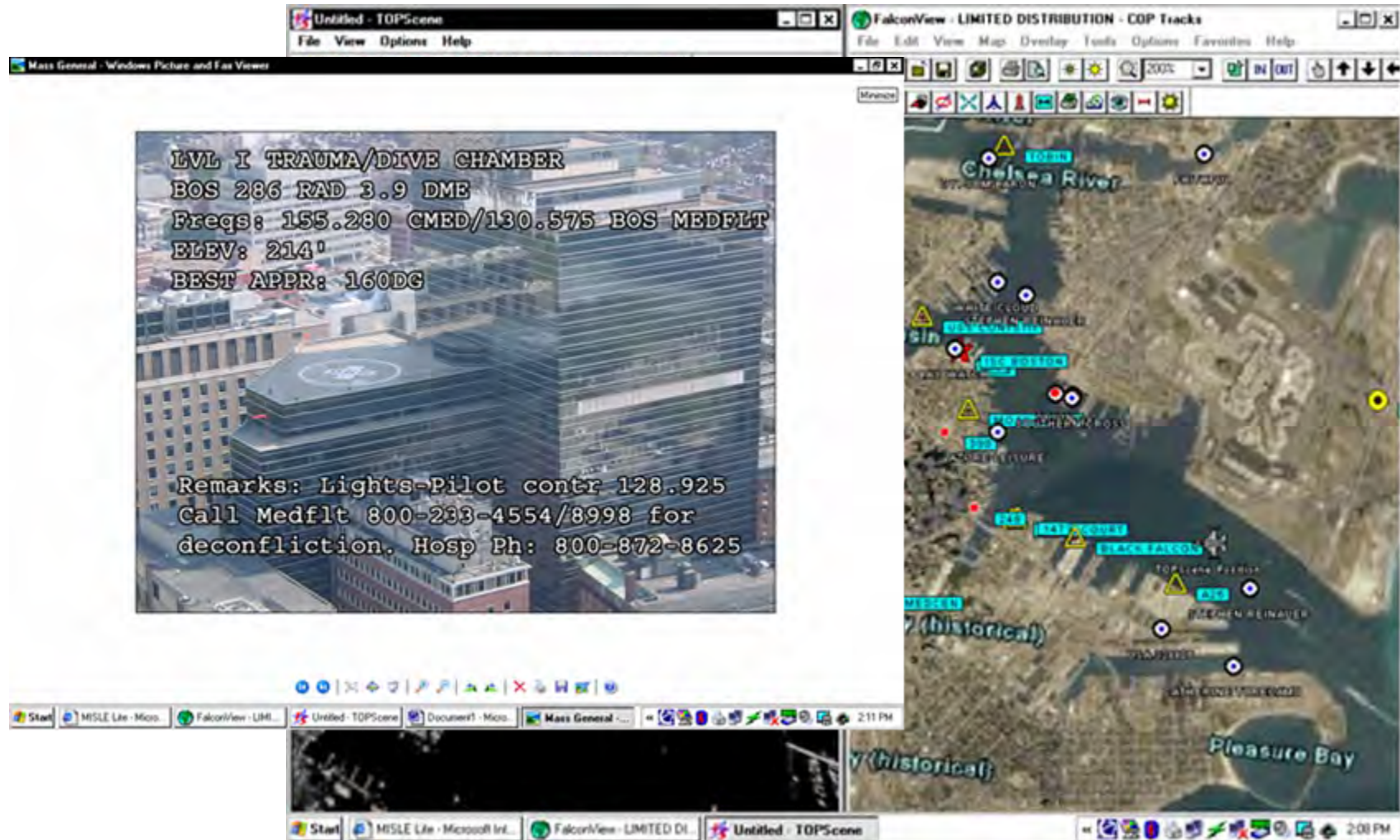
- Enterprise deployment of National Graduate School Masters Program
- Enterprise certification of Toughbook tablet computer
- Enterprise deployment of MISLE Lite
- Enterprise deployment of CG Mission Planning and Execution System
- Enterprise approval for connecting cellular air cards to Coast Guard Data Network
- A more efficient and effective Coast Guard







# Leading Change from the Middle









# Leading Change from the Middle

- More importantly, how did we do it?





# **Leading Change from the Middle**

Collaboration between hundreds of Coast Guard men and woman, DOD and DHS partners, industry, and academic partners

Just a few that come to mind:

## **Air Station Cape Cod Flight Mechanics, Rescue Swimmers, Storekeepers, and Yeoman**

**Bill Imle, Geoff Abbott, Lil Maizer, Bob DeYoung, Bill Balsinger, Ryan Kowalske, Matt Carty, Tim Travis, Michael Krouse, Hank Davison, Paul Hastert, Stephen Hoogasian, Snake Clarke, Doug Robbins, Lou Williams, Rick Barone, Eric Ridge, Ed Friedman, Bob Gee, Robert Netsch, Ryan Wheeler, Joe Healy, Paul Deveau, Charlie Mathieu, Pete Batcheller, Bob Feigenblatt, Rick Christoffersen, Bill Saunders, Dorothy Winchell, Freda Anderson, Tom Sperduto, Bob Griffin, Bob Giffen, Mike Butler, Ralph Kohler, Bonnie Stratton, Dave Morgan, Mitch Morrison, Dave Sohn, Audrey Pfeiffer, Nancy Weiss, Dan Ronan, Jack Santucci, Chris Bailey, Michael Boykin, Toni Dineen**

# Leading Change from the Middle



USCG Innovation Council

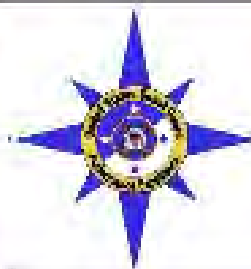
Innovation Expos  
Innovation Grants  
Innovation Transitions



The National Graduate School

LCDR Maizer, CAPT Abbott, ADM Allen  
Maritime Awareness Data Dissemination  
Team 2002-2003

Airborne Data Communications System 2003-2004  
Automatic Identification System Team 2005-2006



USCG Performance Excellence



Organizational Performance Consultant (OPC) Role



# Leading Change from the Middle

## Questions?

LCDR Chris Kluckhuhn

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508-360-4398

[christopher.l.kluckhuhn@uscg.mil](mailto:christopher.l.kluckhuhn@uscg.mil)





Represented by  
**Kevin Lawson**

Applications Development Branch Chief  
Office of Information Technology  
Transportation Security Administration  
**[kevin.lawson@dhs.gov](mailto:kevin.lawson@dhs.gov)**



# The IdeaFactory Site



## IdeaFactory

The TSA IdeaFactory is the place to build, promote, and comment on bright ideas.



1. Build an idea for everyone to view.



2. Promote ideas that are too good to ignore.



3. Comment and discuss the pros & cons of an idea.

### Build New Idea



Build an idea for everyone to view. [more >>](#)

The TSA IdeaFactory has built: **187** ideas » promoted **1229** times » **845** comments

You have built: **0** ideas » **1** promotions » **0** comments

### Search

To avoid duplication, please search for existing ideas before you build a new idea. You may also view ideas by browsing the categories listed below.

### Categories

All Categories

CHALLENGE: Individual judgment verses system-wide consistency  
Performance Accountability and Standards System (PASS)

Technology

At the Airport

At the Checkpoint

TSO Scheduling

Quality of Life/Workplace

Customer Service

Training

Improving Communications

Improve TSA's IdeaFactory

popular ideas

recent ideas

comments

ideas in action

about

faq

All



Promote idea

### TSA Assignment Swap Program

Quality of Life/Workplace, submitted by jean.forand 4/26/2007 2:22:42 PM » [Report Unmarked SSI](#) » [Report Abuse](#)

Unhappy with where you work? Ill bet there is someone out there who would love to swap job locations with you.

How? Develop a web base bulletin board where individuals looking for an assignment swap could log on and search for a match. Once a matching swapper is found you could initiate contact via email or phone and discuss details. The move would be at no cost to the government, you would be required to take annual leave for the move and management would have to approve the qualifications of both parties. Swappers would have to be in the same payband performing the same duties.

Benefits? Happy people! No lose in FTE. No cost to the government. The ability to move to other locations within the agencies without having to "KNOW" someone.

Precedence: The US military has been doing this for years and years



Comment and discuss the pros & cons of this idea.

53 comments >>



Promote idea

### Change PASS to reflect true Pay for Performance

Performance Accountability and Standards System (PASS), submitted by chadwick.bonds 4/27/2007 9:45:39 AM » [Report Unmarked SSI](#) » [Report Abuse](#)

Currently PASS allows you to accumulate points to achieve one of three performance grades:

# The IdeaFactory Innovation Process





# **Idea** **Factory**

**Stop by BOOTH #404  
for a demonstration**

**Please send all inquiries about the  
IdeaFactory to:**

**[ideafactory@dhs.gov](mailto:ideafactory@dhs.gov)**

# Virtual World, Real People



U.S. Coast Guard Innovation Expo  
October 29 - Nov 1, 2007  
New Orleans, LA

John Lester (Pathfinder Linden)  
Boston Operations Director  
Linden Lab



# what is Second Life?



Second Life is a unique online world

- international community, multiuser, persistent world
- not a game
- Linden Lab provides a platform and tools for content creation
- all content created and owned by the residents
- client is Open Source

best fictional analogs are Stephenson's Metaverse from "Snow Crash" or Vinge's Otherverse from "True Names"

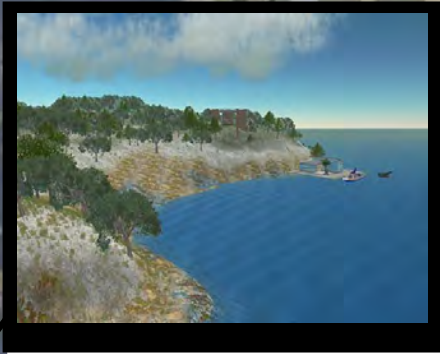
# A new approach to world building



- Stream all content via broadband
- Extremely dynamic content
- Apply distributed/grid computing



15,000 CPUs  
375 square miles  
Escape, Entertainment, Education, Work, Advocacy  
Free to Access, Fees for Land Ownership



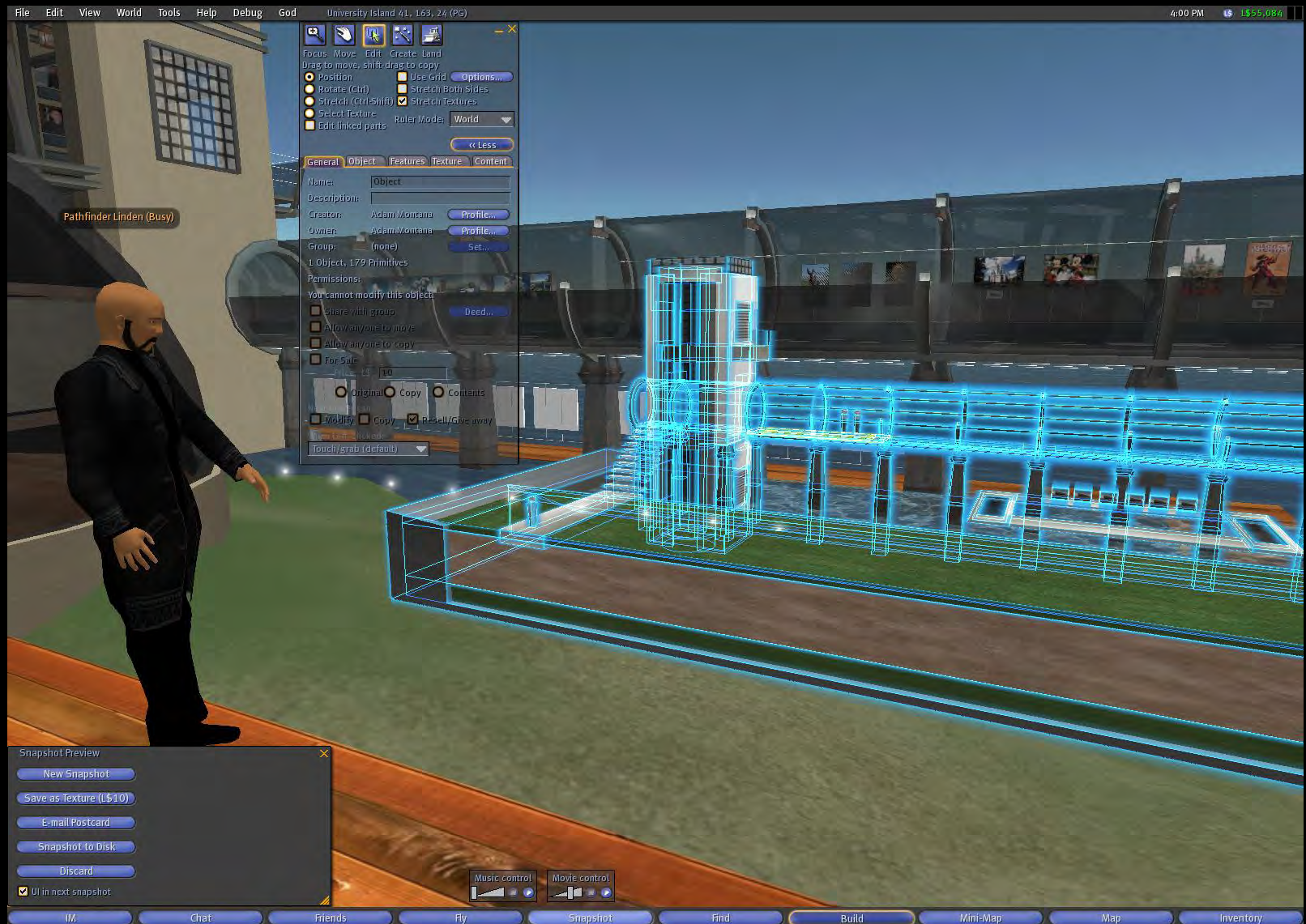
# Demographics



- SL community older and more gender balance than typical MMO games
- Gender neutral by hours of use
- Median age of 35
- Real world skills translate into Second Life (remember, this isn't a game)

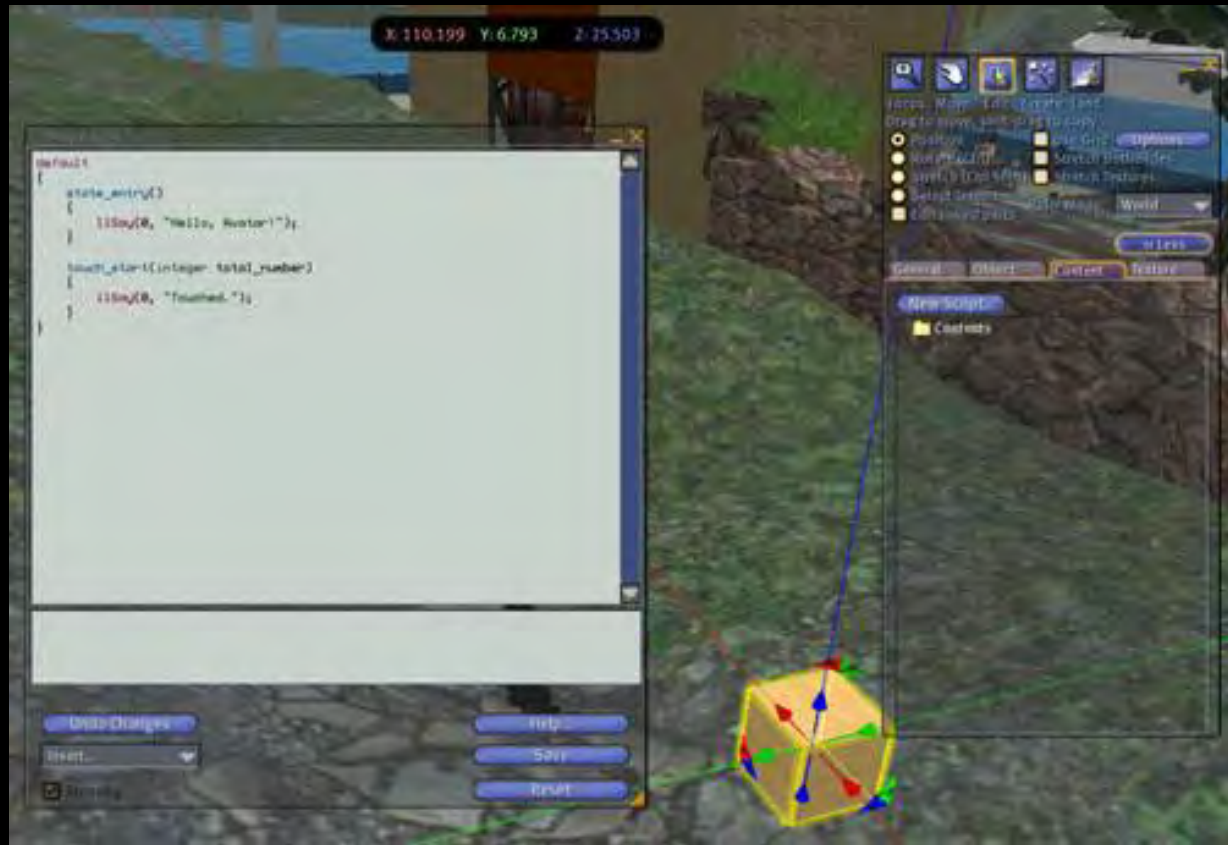


# Building in 3D using geometric primitives



<http://tinyurl.com/2bwrtj>

# Breathing Life into Objects with Scripting



Any object can be given physical behavior, interactivity, and can communicate with the world (e.g., email, HTTPRequest, XML-RPC)



# Property Rights

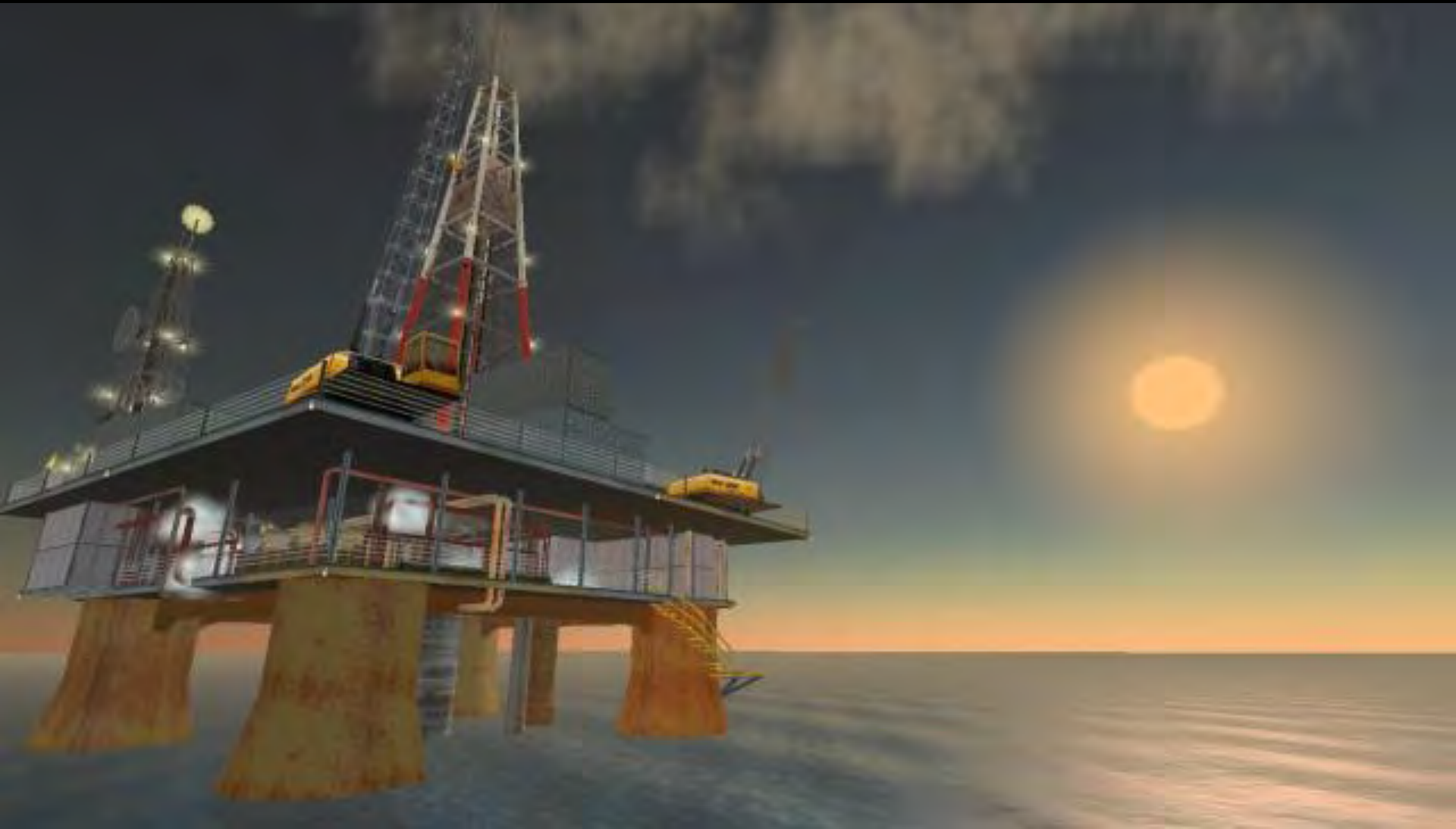


In Second Life, residents own their creations

What does this mean?

- Residents retain their Intellectual Property rights to their creations
- Residents may buy and sell L\$ for US\$
- Residents may license their creations back into the real world

It's about the richness of relationships between  
People and Places





# Emotional Bandwidth

:( : ) ;P

# Emotional Bandwidth



Use real-world social cues and proxemics, animations and sounds,  
and create your visual identity

















# regina spektor







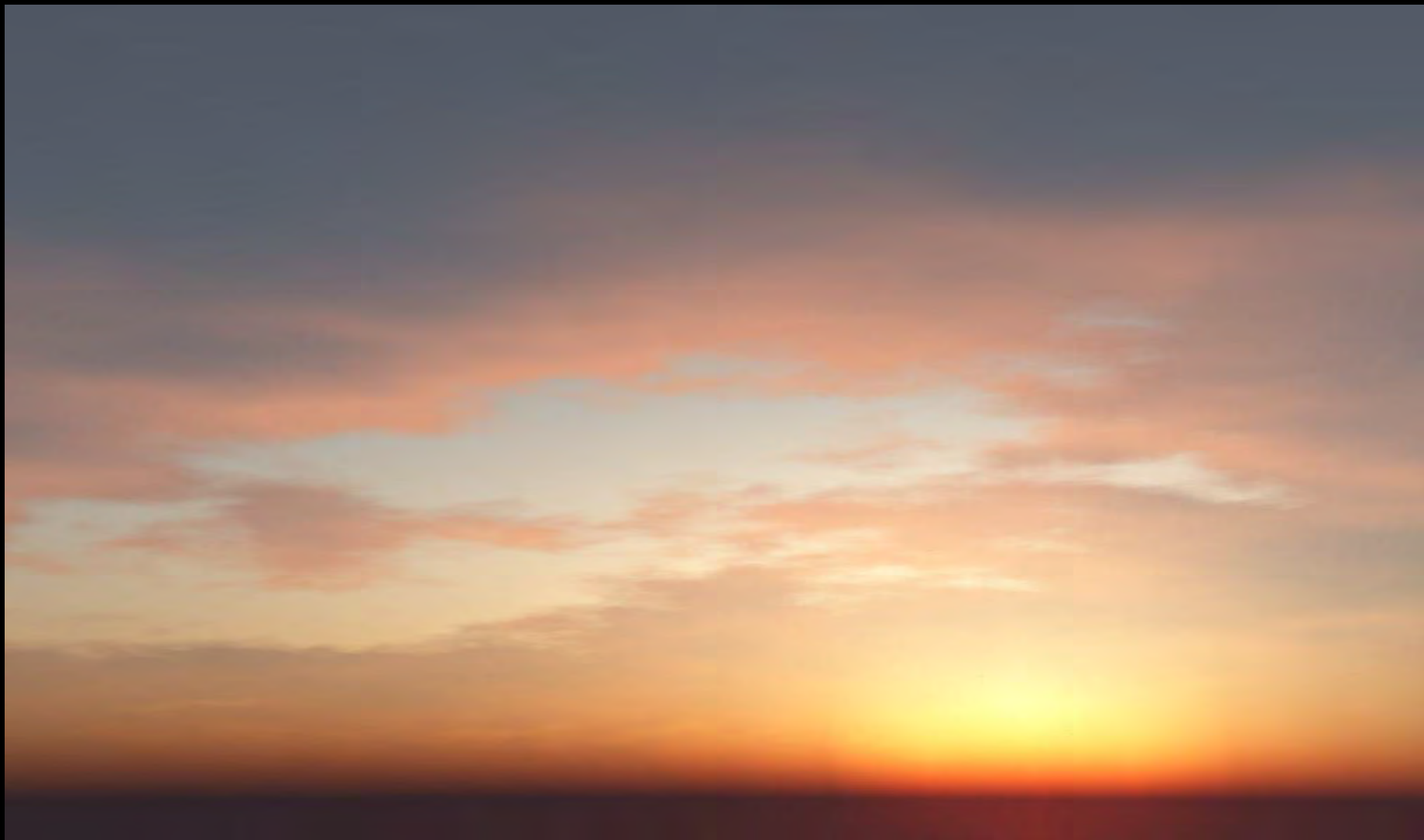


People + Tools + Shared Spaces = Metaverse

*Increased Perceptual Immersion  
leads to  
Increased Emotional Bandwidth*

We are trading the Tyranny of Geography  
for the Bondage of Bandwidth

# Advanced Atmospheric Rendering



“WindLight” – Customizable and Tradable Assets

# Voice



## Spatialization and Attenuation

# Sculpted Primitives – “Sculpties”



Creating Complex and Organic Shapes



# Shared Spaces based on Reality



Vassar College's recreation of the Sistine Chapel



# Shared Spaces based on Reality



Vassar College's recreation of the Sistine Chapel



# Shared Spaces based on Reality



Vassar College's recreation of the Sistine Chapel



# Shared Spaces based on Imagination



“Straylight” Island – Created using Sculpted Primitives



# Shared Spaces based on Imagination



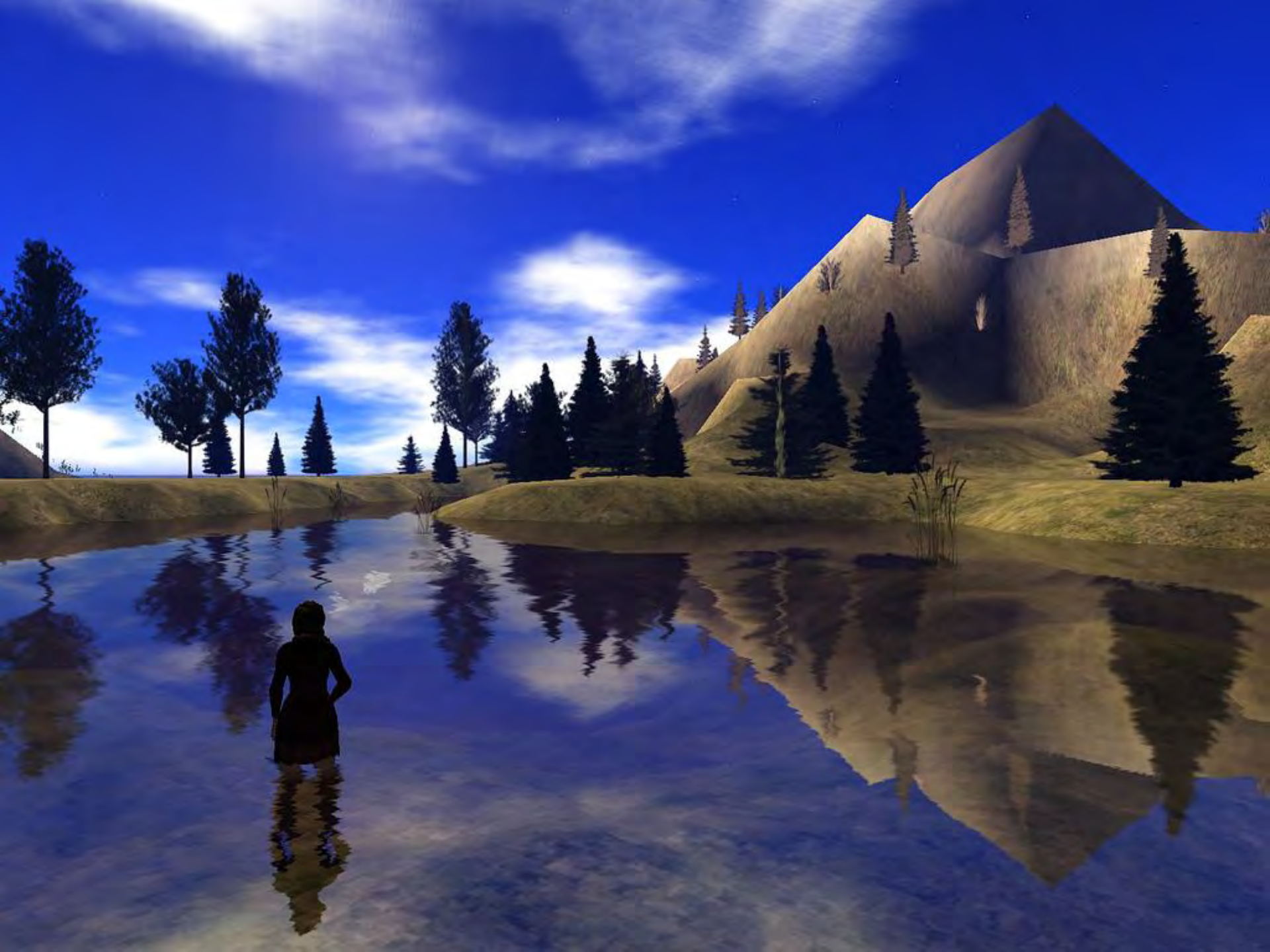
“Straylight” Island – Created using Sculpted Primitives



# Perceptually Immersive Environments



Windlight Feature – Customized and Sharable Atmospheric Effects















# Companies



- IBM, Cisco: 6,000 employees
- Starwood Hotels “aloft” - real hotel prototyping with customer input
- Pontiac - engineers meeting with Residents
- <http://secondlife.reuters.com>

# Real Educators



- Teach using simulation and experiential learning
- New media art, programming, cultural studies, language training...
- Over 300 different universities and academic organizations

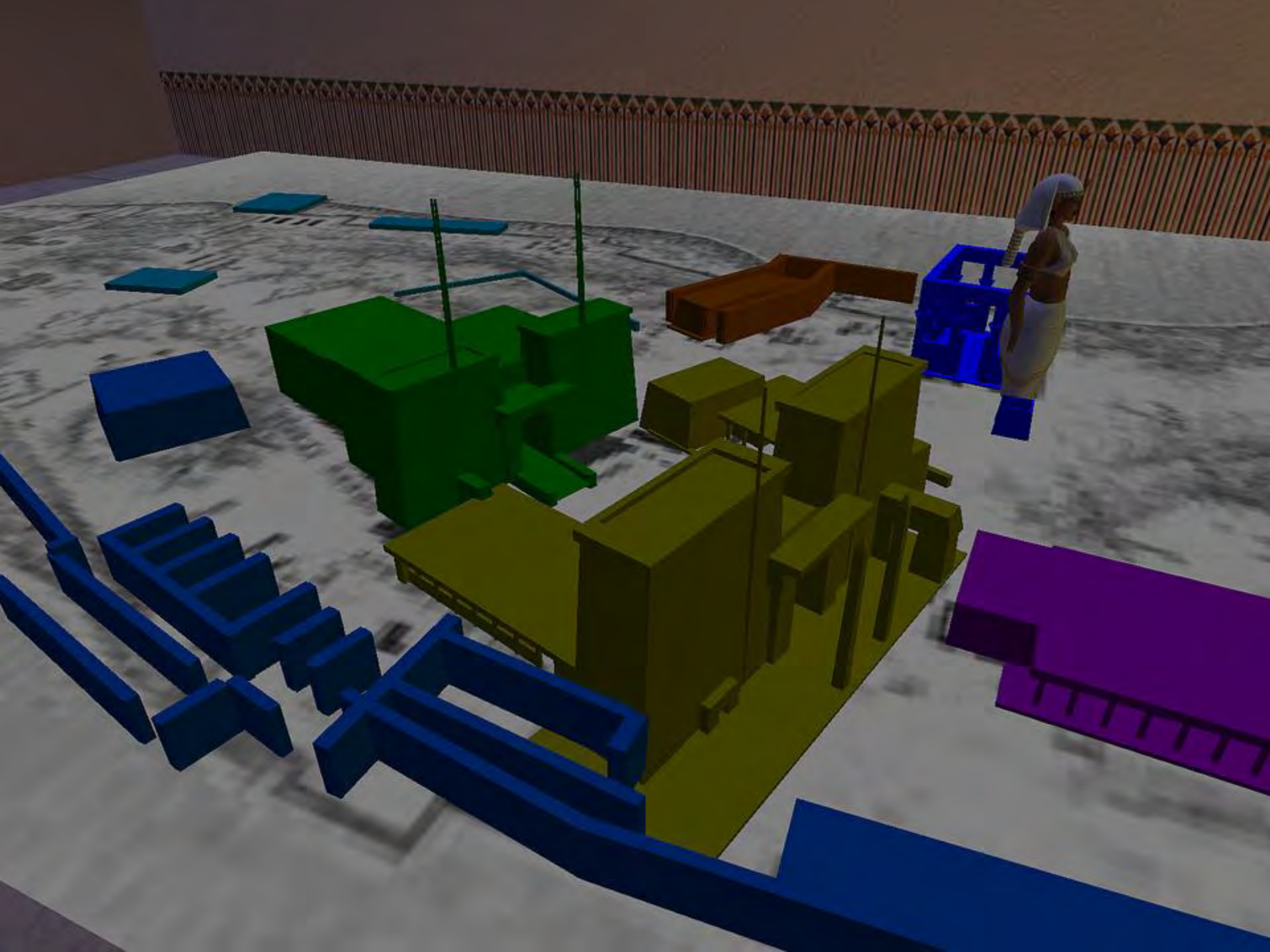


# Personal Creativity











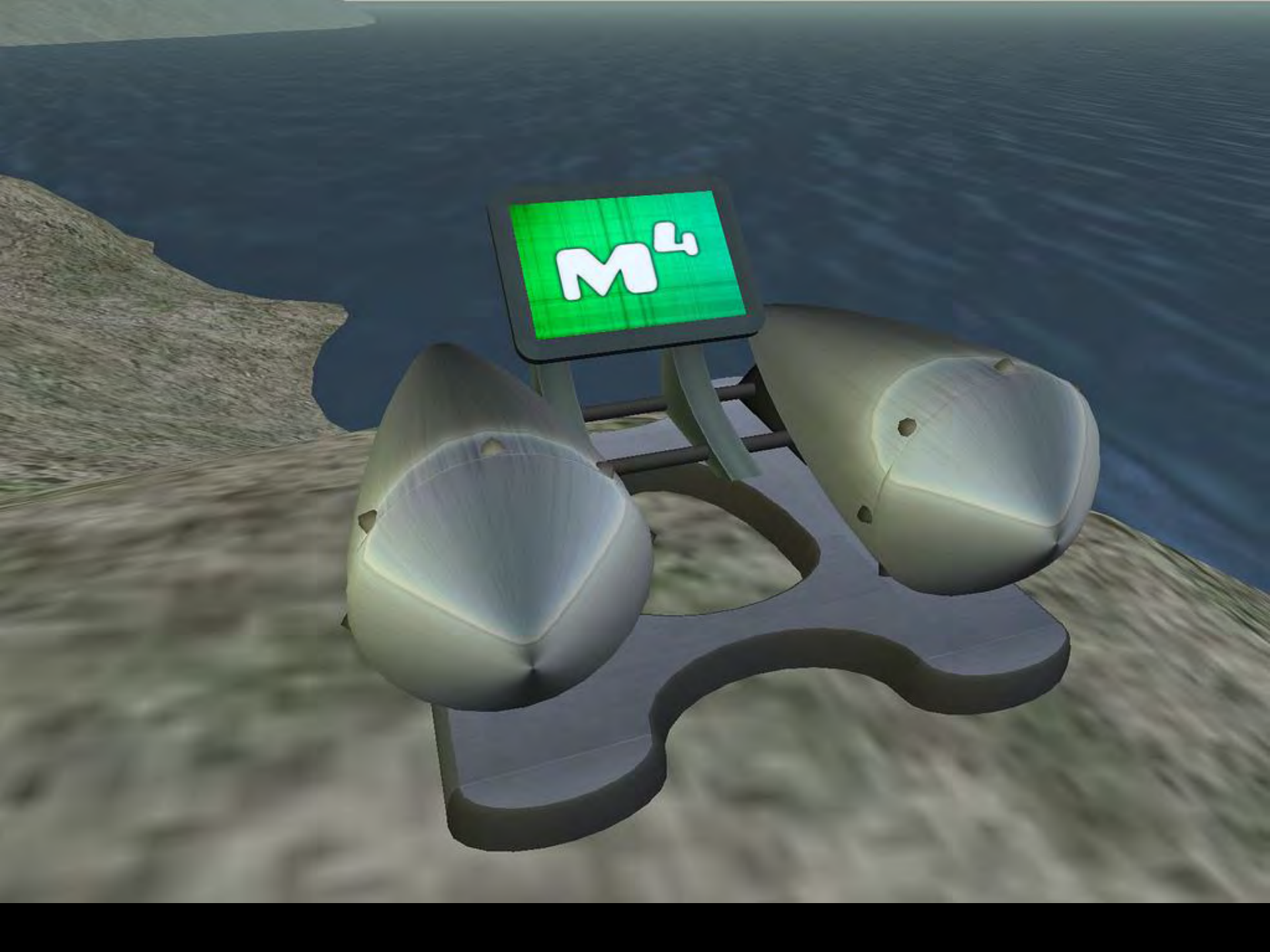




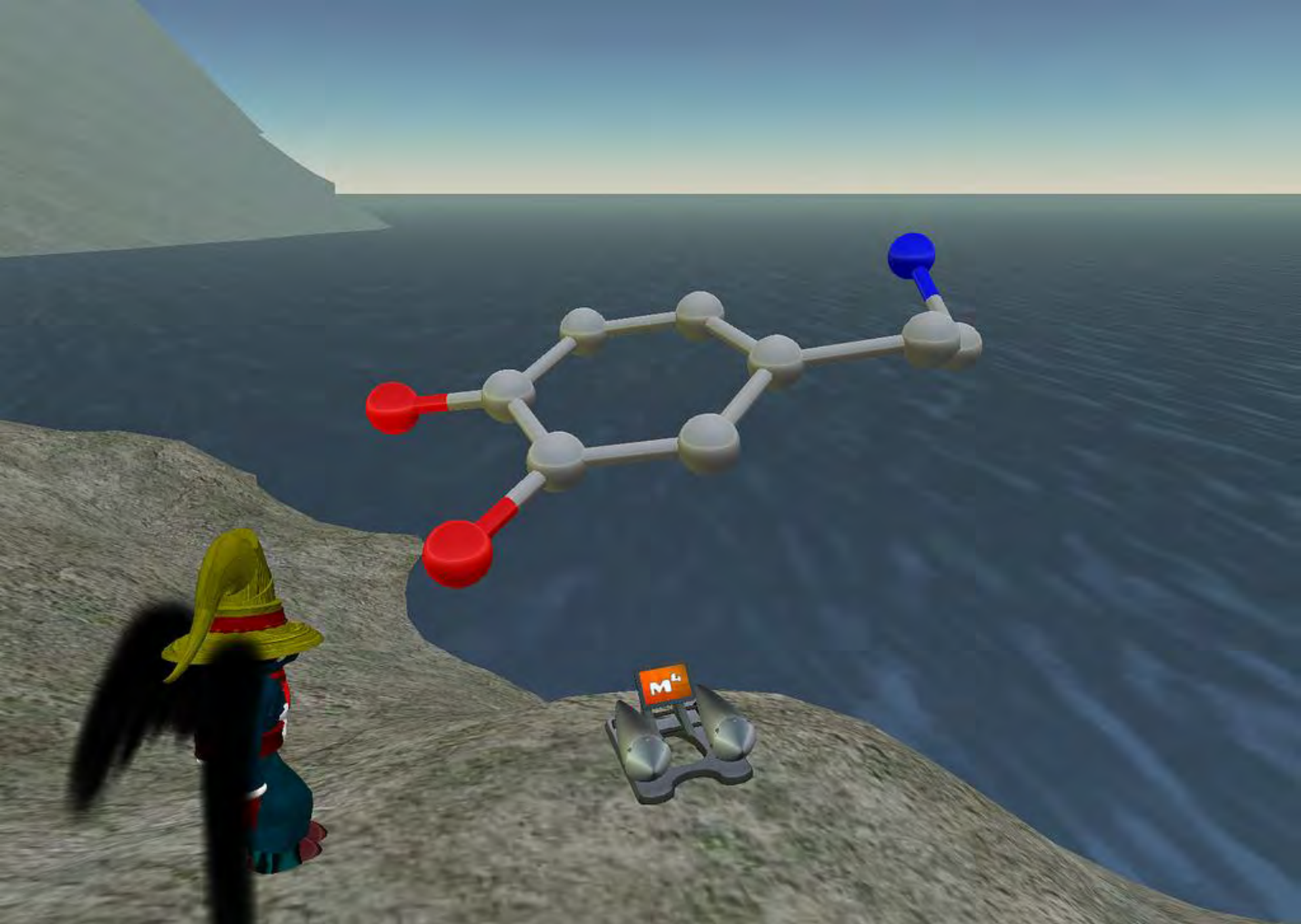




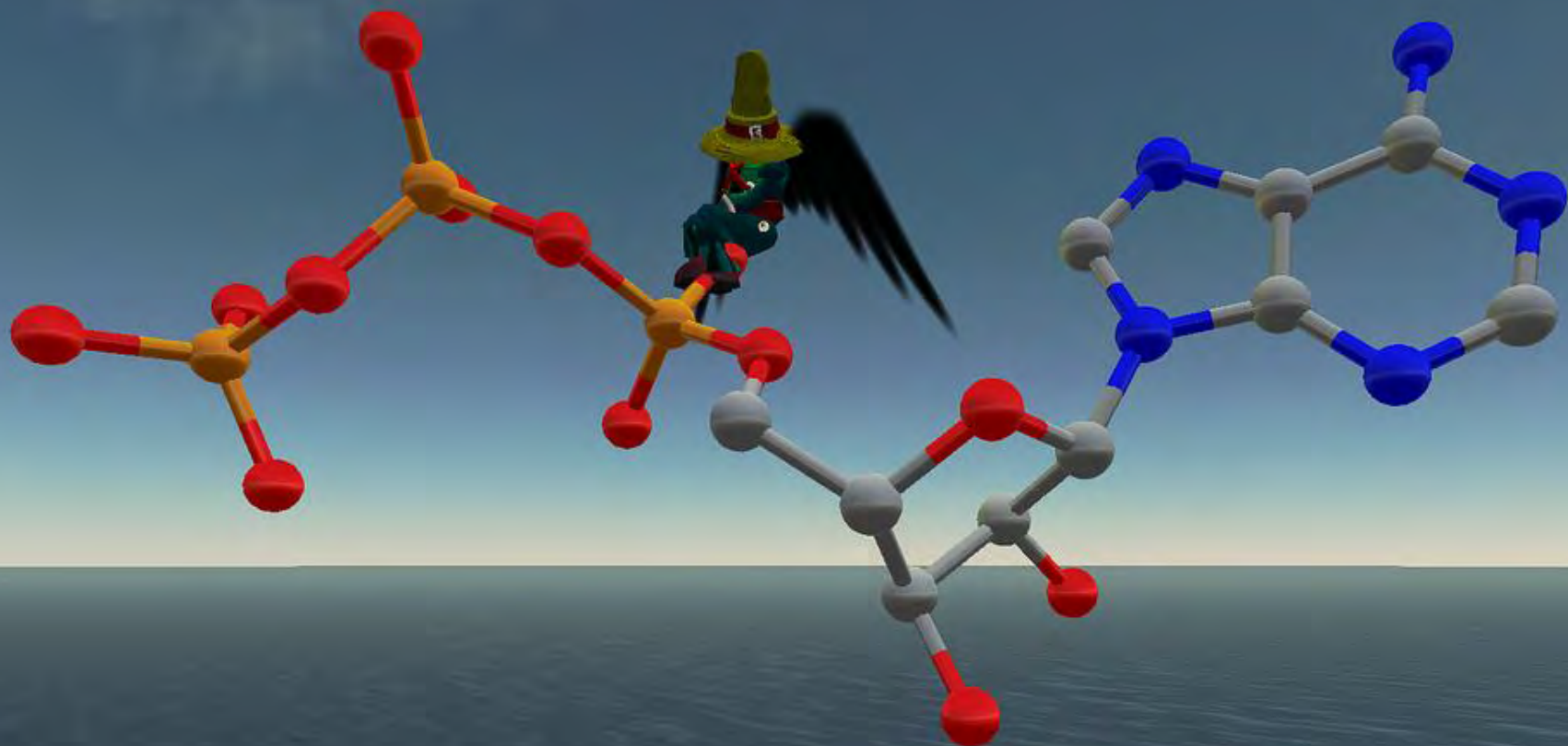


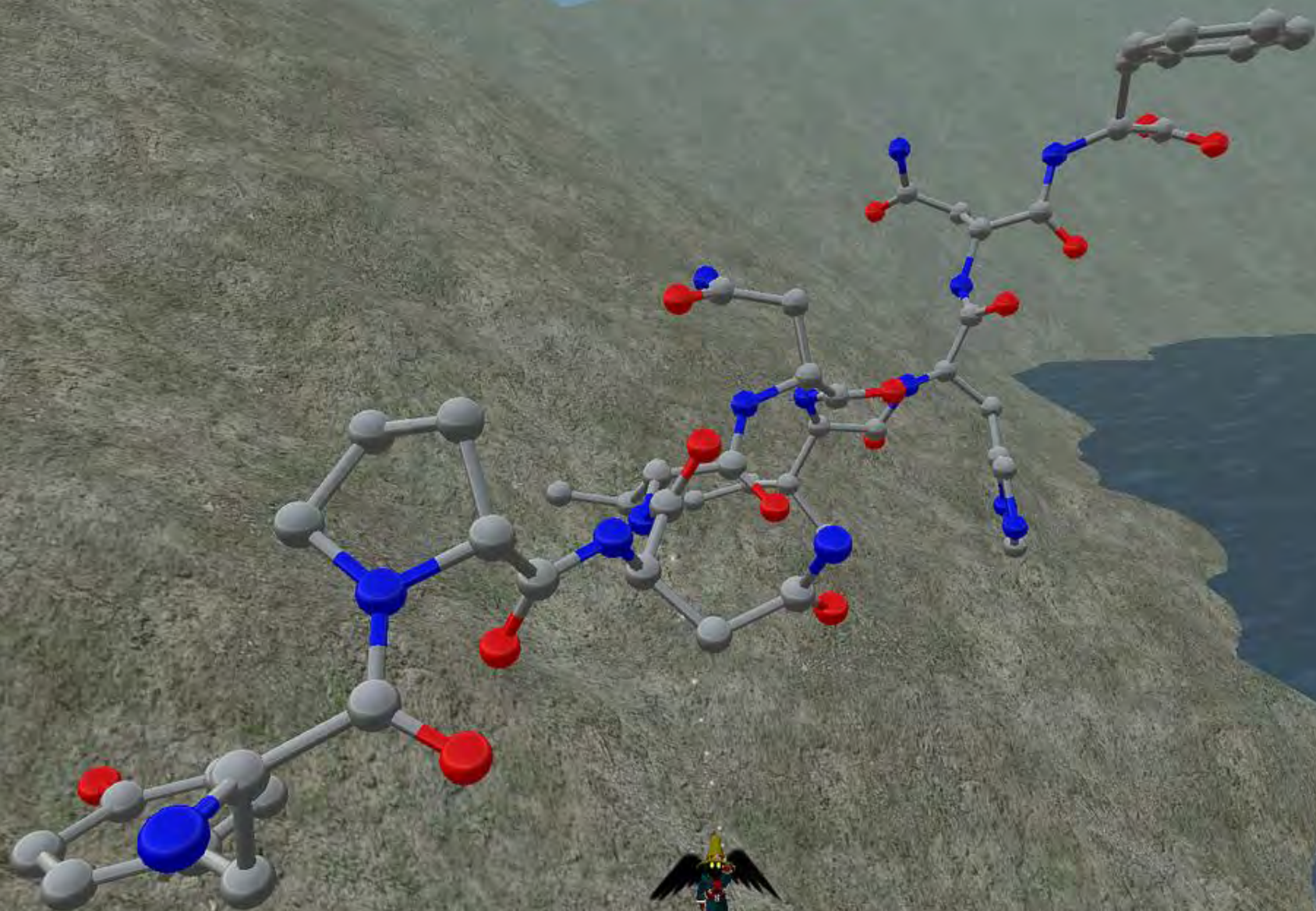














# NOAA - Education in Second Life

<http://tinyurl.com/yovhmp>



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<http://tinyurl.com/yovhmp>





# NOAA - Education in Second Life

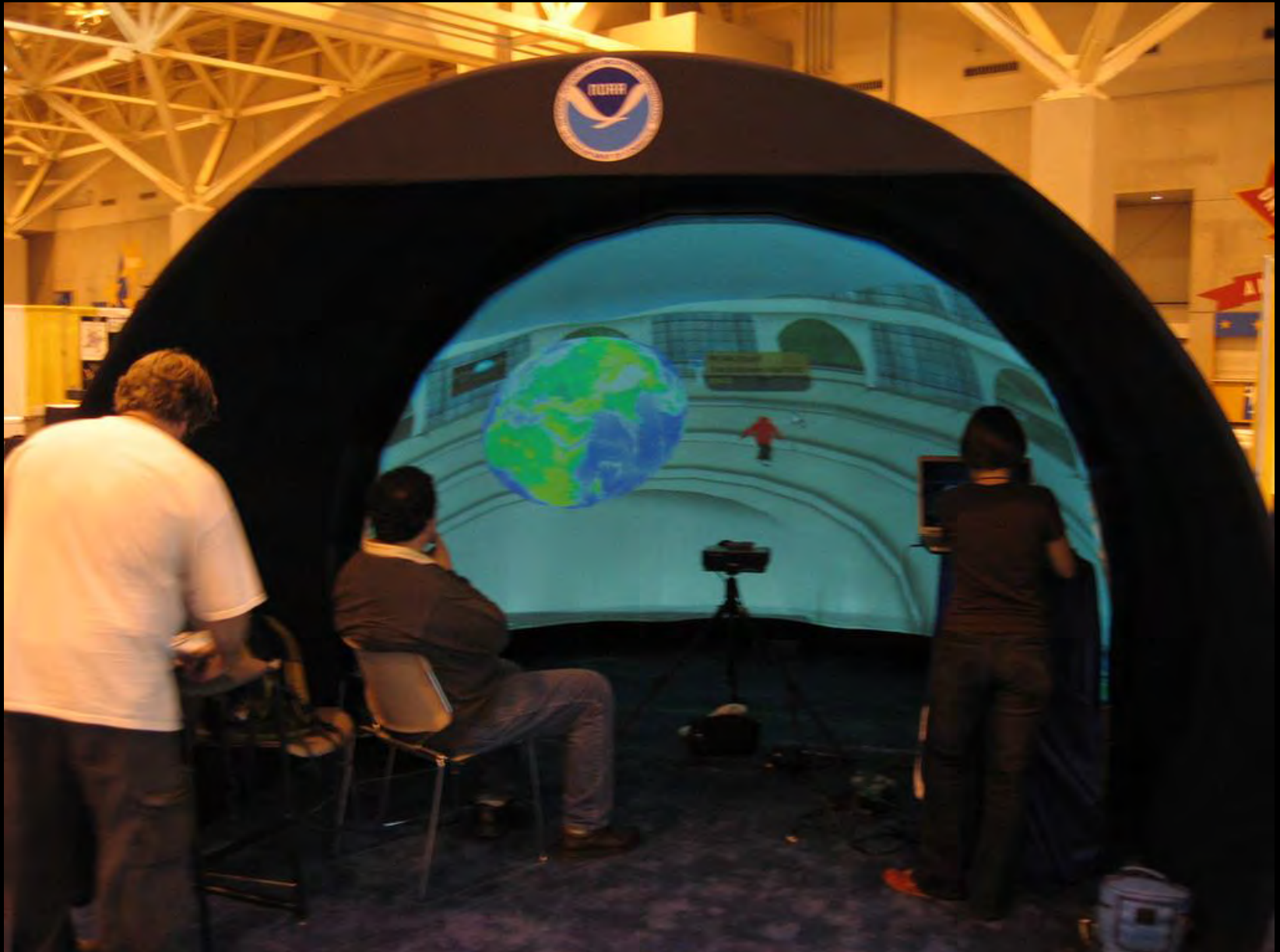
<http://tinyurl.com/yovhmp>



Aimee Weber's Hurricane Hunter Demo

# NOAA - Education in Second Life

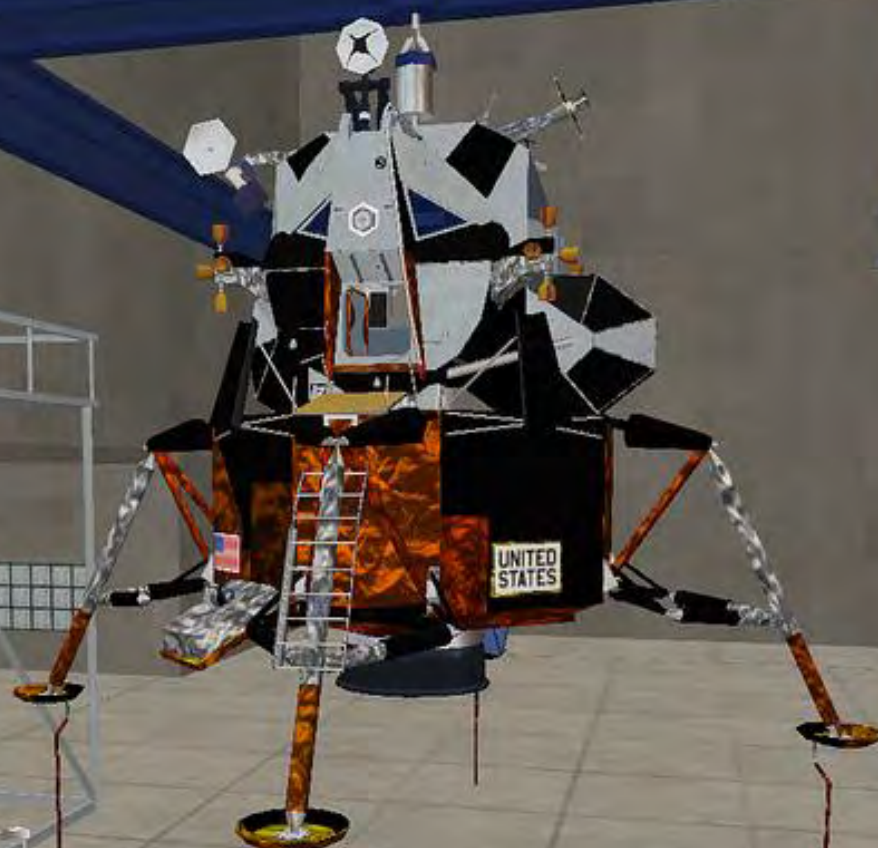
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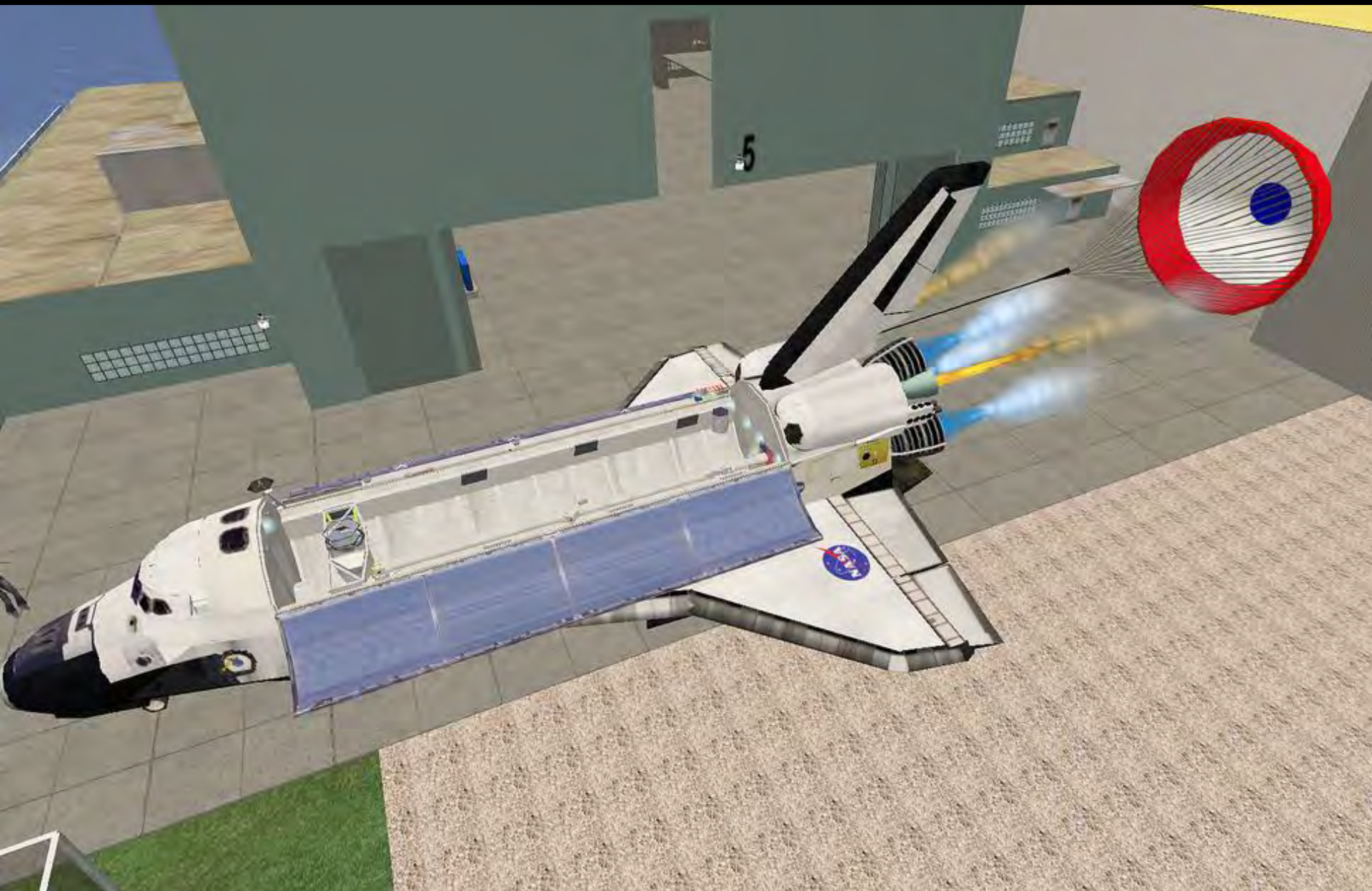


# NASA - International Spaceflight Museum









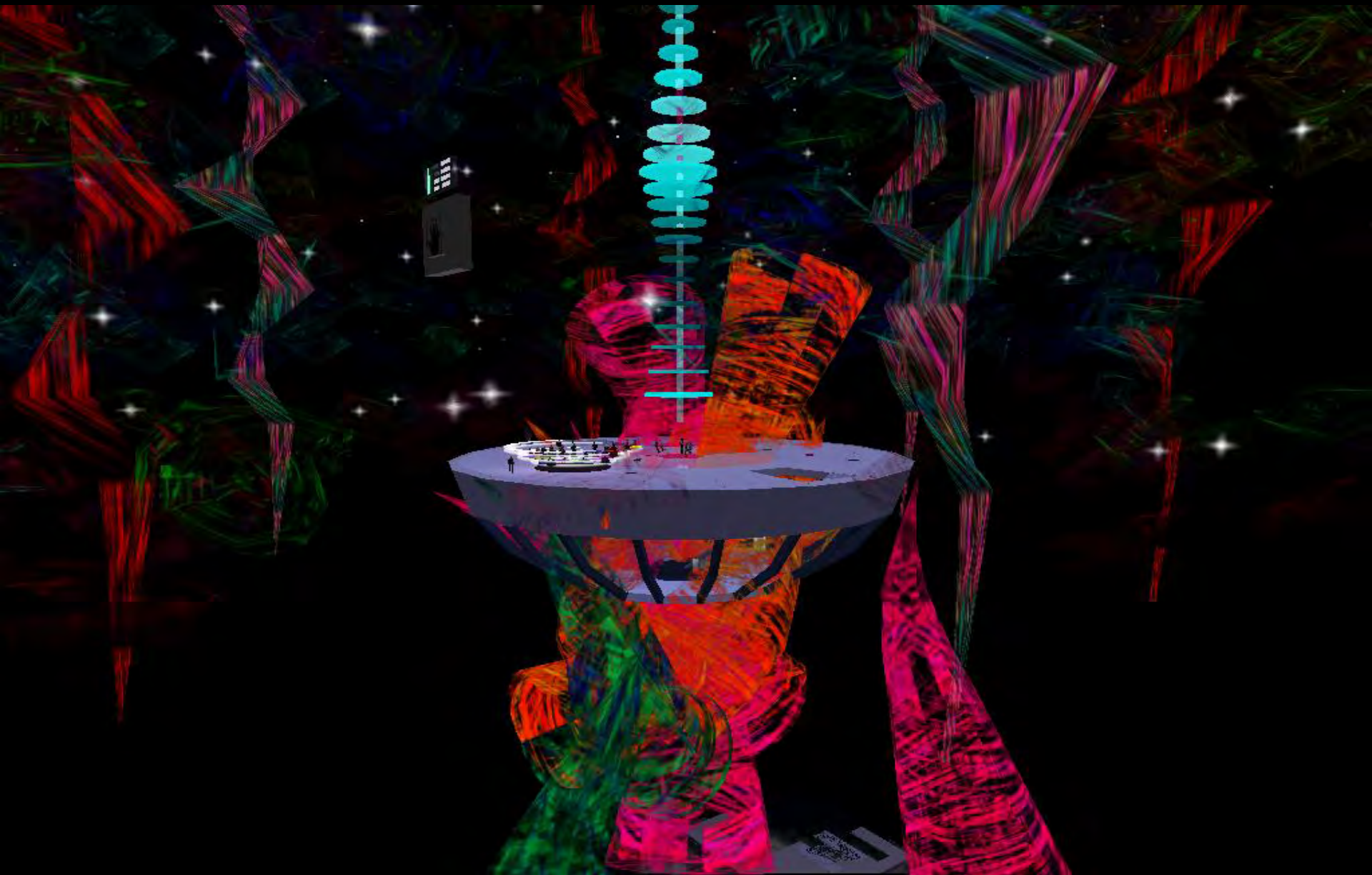
# New Media Art



- DanCoyote Antonelli's Live Performance Art



# New Media Art



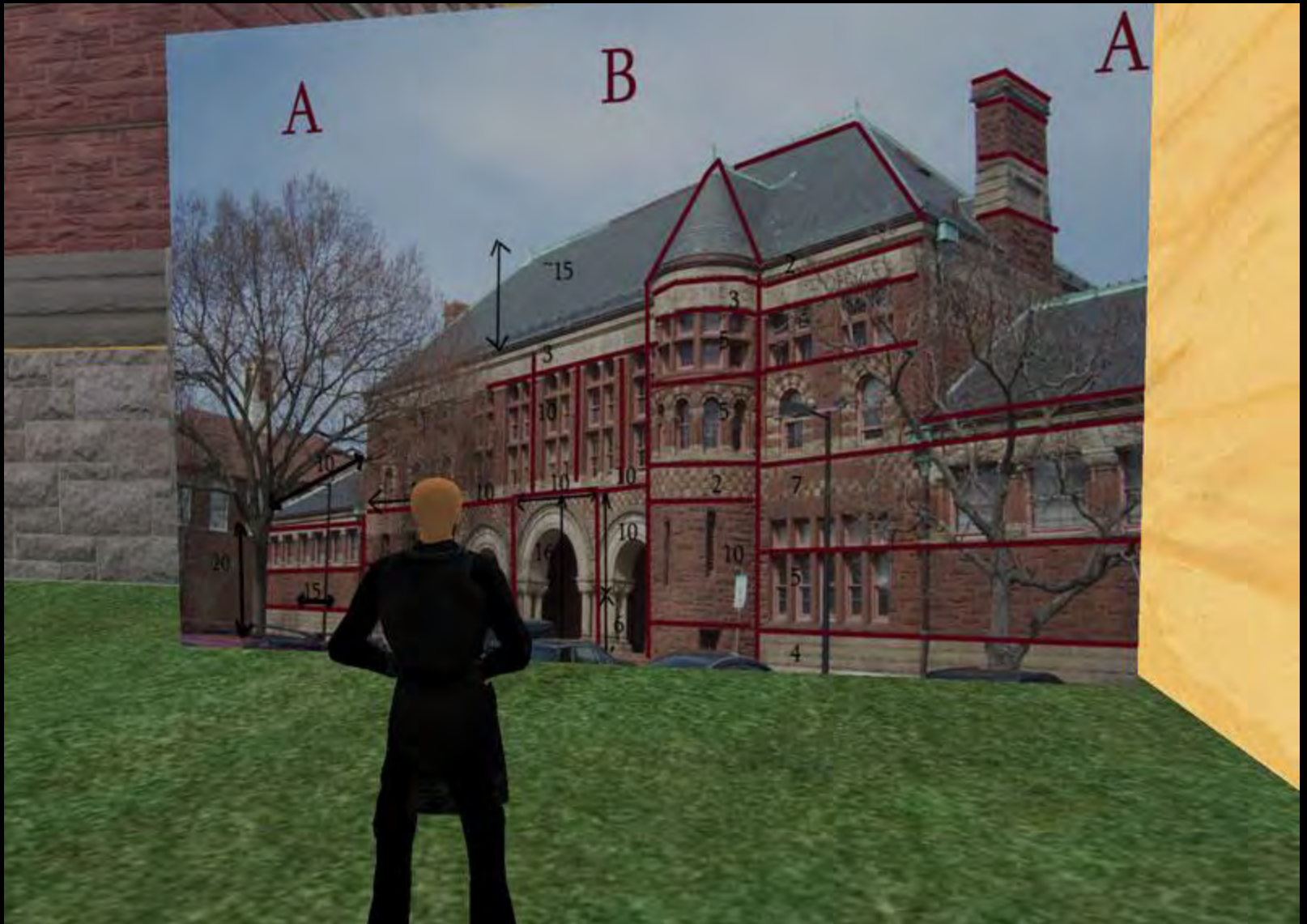
# Creating a Digital Ecosystem



Ecosystem Working Group - <http://tinyurl.com/t7w7t>



# Harvard's Austin Hall – Berkman Center









Welcome to  
“Mixed Reality”



# communities of support

Asperger's Syndrome  
stroke survivors  
depression support  
cerebral palsy  
children with cancer



# From Creative Vision to Reality



***Second Life Resident Simon Walsh, founder of “Wheelies”***

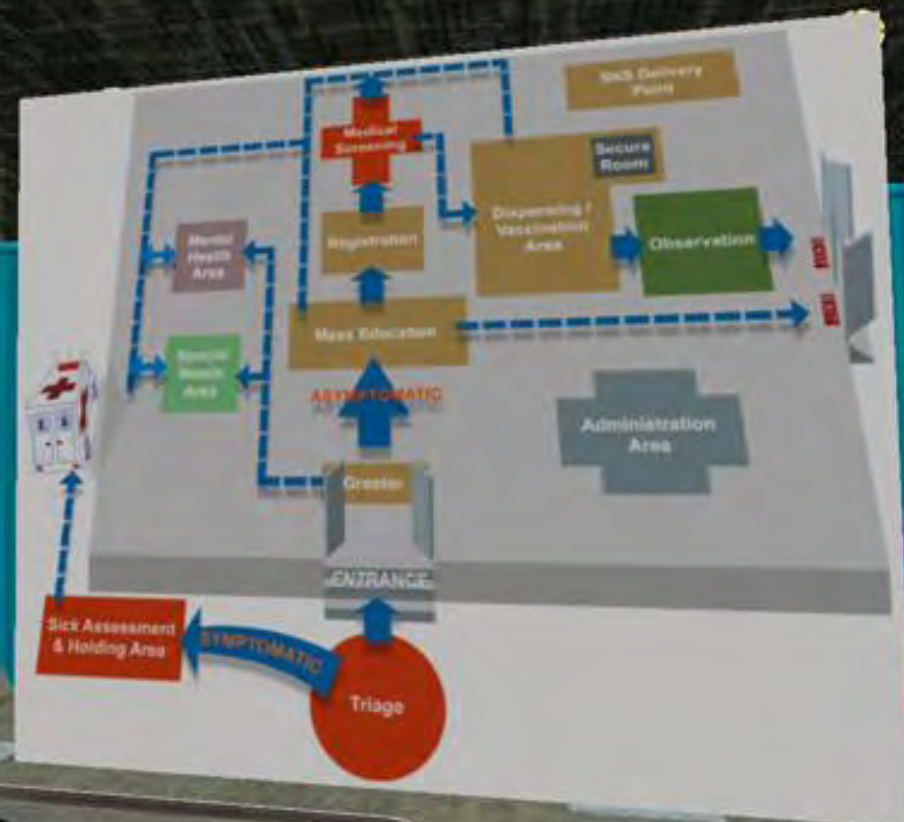
***<http://tinyurl.com/y26hug>***

# first responder and caregiver training



process  
experience  
empathy







# Innovation is atoms + electrons

I see people in Virtual Reality every day on the bus...

Tools for changing electrons into atoms...

The playing field is getting flatter...





# 3D Printing




[Fabjactory.com](http://Fabjactory.com)

# An Artifact from the Near Future



# The Challenge of New Media



New Media 1740-1915

Bell's attempt to sell patent for telephone to Western Union  
“Why would telegraph operators want to talk to each other?”

First “online” marriage,  
via telegraph, late 1800's

It took 65 years after the invention of the printing press for someone to decide that putting page numbers in books was a “good idea.”



# We get Mired in Past Frameworks



Phonograph and the Spoken Word

What does a “classroom” look like  
in a virtual world?

The telephone is not the telegraph

Movies are not plays

# Thank you for listening



- John Lester (SL: Pathfinder Linden)
- Friend me on Facebook (John Lester)
- [www.pathfinderlinden.com](http://www.pathfinderlinden.com)
- [Pathfinder@lindenlab.com](mailto:Pathfinder@lindenlab.com)

# Maritime Domain Awareness Day

## *"Operationalizing MDA"*



2007 USCG Innovation Expo



# Maritime Domain Awareness Day

## *"Operationalizing MDA"*



## 2007 USCG Innovation Expo

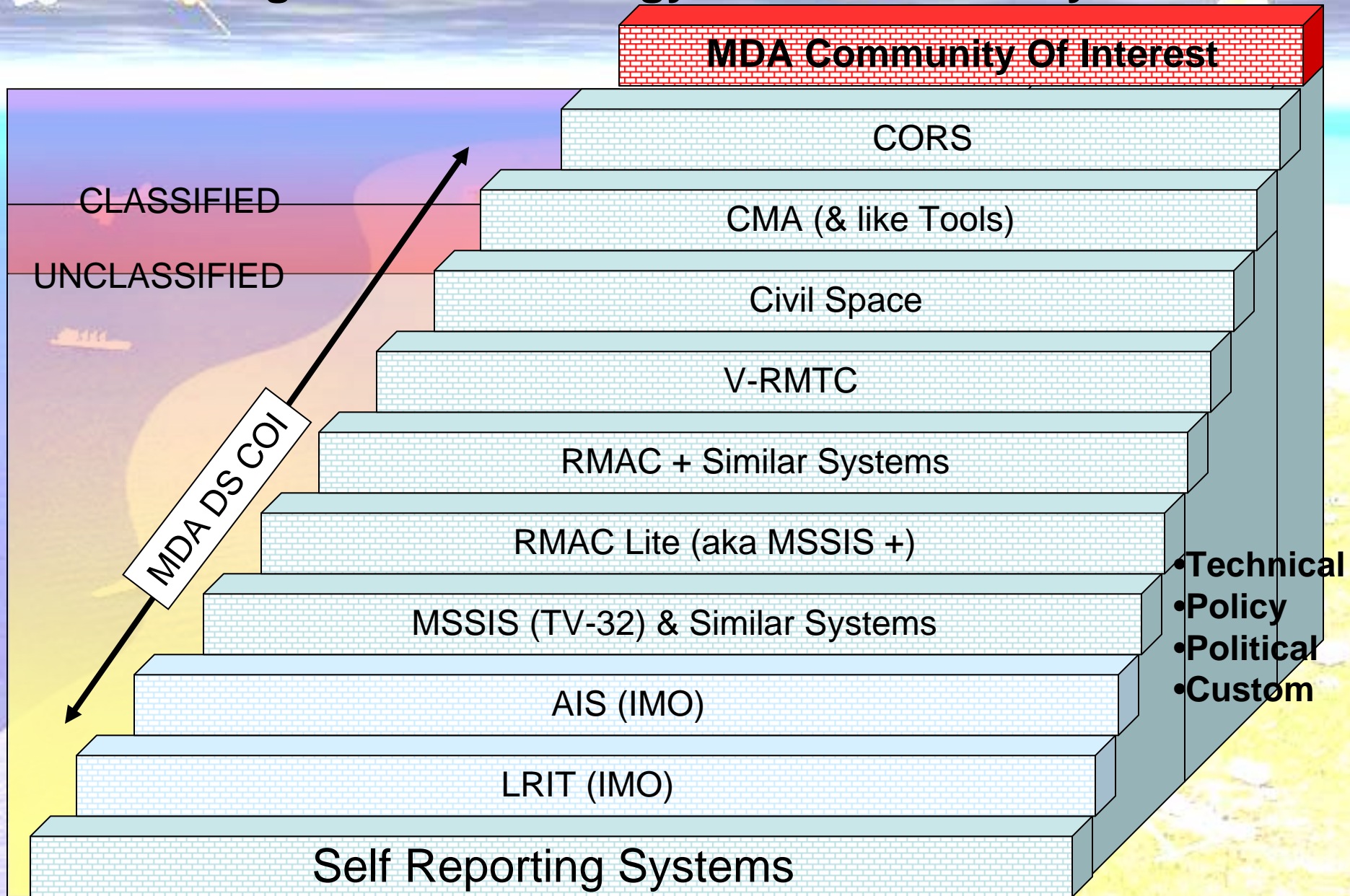
# Maritime Domain Awareness Day

## *"Operationalizing MDA"*



## 2007 USCG Innovation Expo

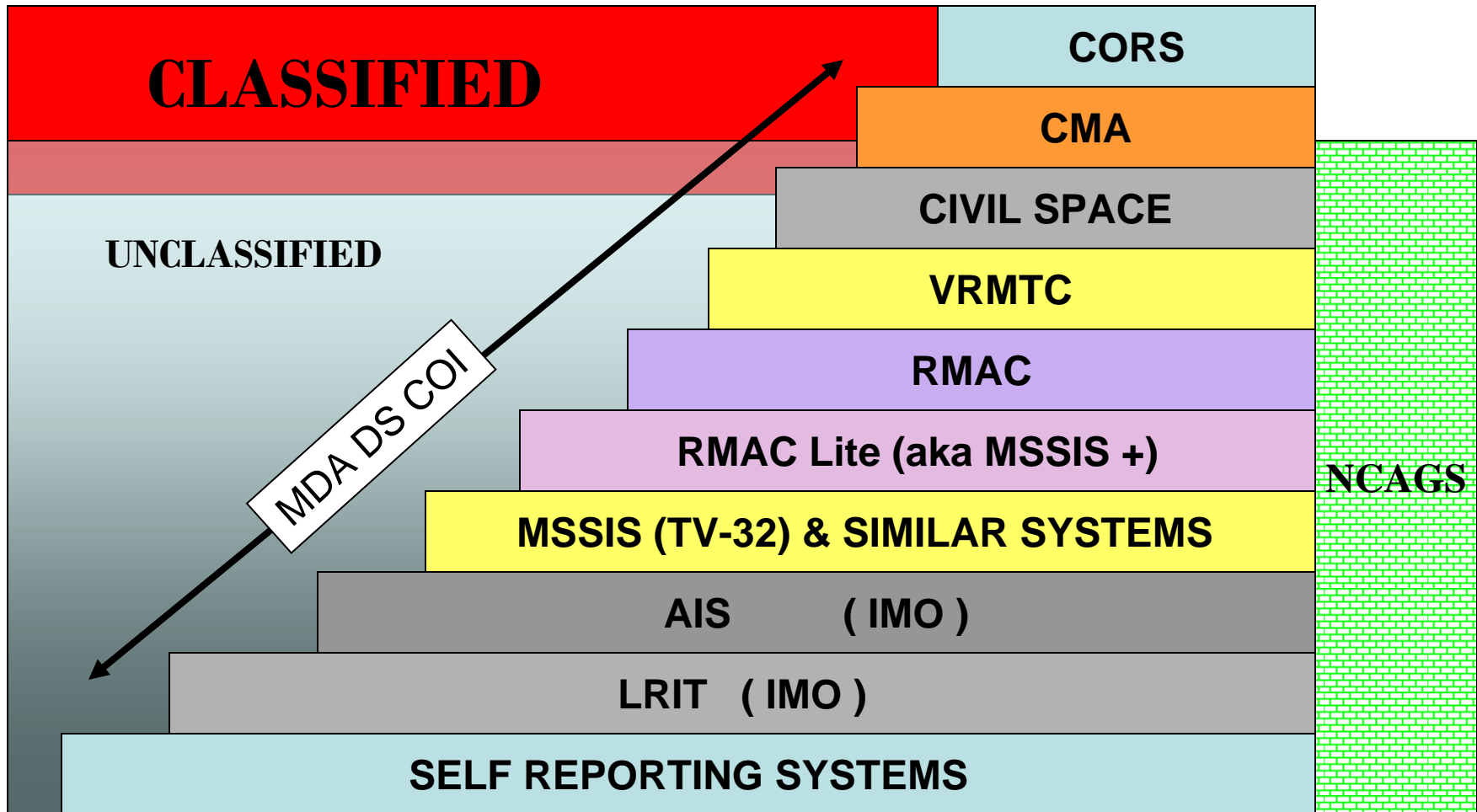
# Sharing Data: Technology Issues and Policy Issues



**Vessel Tracking: Commercial / Fishing / Working / Recreational**



# International Building Blocks for GMSA



**Commercial / Fishing / Working / Recreational**

# U.S. Coast Guard Innovation Expo

October 30, 2007

DHS Science & Technology Directorate  
Maritime Security Program

CAPT David Newton, USCG  
Acting Director  
Border & Maritime Security Division  
Science and Technology Directorate

*From Science and Technology... Security and Trust*

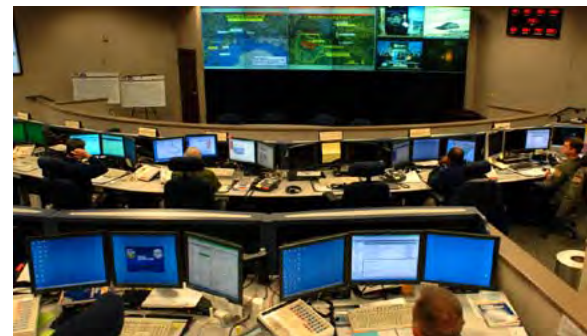
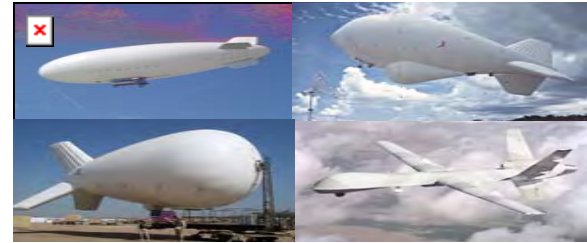


## Homeland Security



# Representative Technology Needs

- Wide-area surveillance from the coast to beyond the horizon; port and inland waterways region – detect, ID, and track
- Data fusion and automated tools for command center operations
- Vessel compliance through non-lethal compliance methods
- Enhanced capability to continuously track contraband on ships or containers
- Improved ballistic personal protective equipment for officer safety
- Improved WMD detection equipment for officer safety; improved screening capability for WMD for maritime security checkpoints



Homeland  
Security



# Wide-Area Surveillance

## “Wide” area

- From the coast to beyond the horizon
- Port region
- Inland waterways

## Technology shortfall

- Three capability areas:
  - Detection
  - Identification
  - Tracking



## Operator issues/concerns

- Legacy surveillance tools designed for supporting pre-9/11 mission set (response-oriented)
- Need for *persistent* surveillance capability
- Classification of small, stealthy vessels
- Ability to access and fuse intelligence data into actionable information

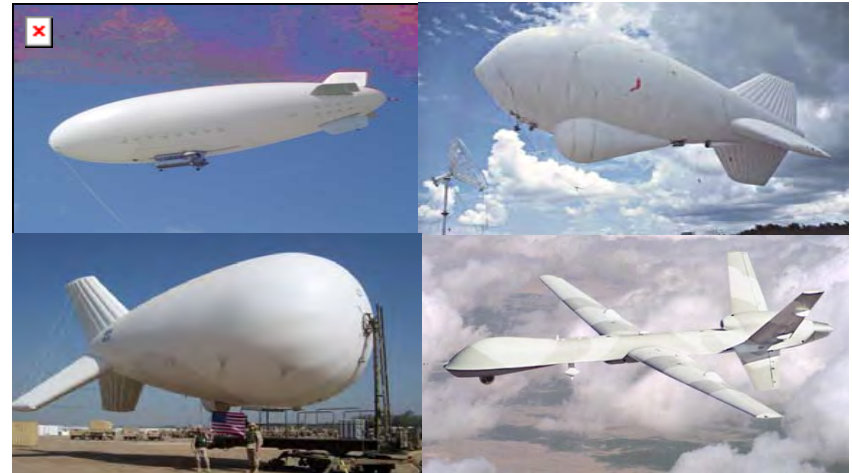


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Security

# Wide-Area Surveillance (continued)

## Cross-functional values of the technology

- Primary customers – USCG, CBP (AMO)
- Planned partnership with other relevant agencies to prototype and evaluate long-term solutions to WAS sensor and platform requirements



## Future anticipated deployments

- Demonstrate a persistent WAS COTS/GOTS capability to explore CONOPS and data integration issues
- Deliverable systems will be driven by the results of the demonstration and in conjunction with customer input throughout the program development process



**Homeland  
Security**

# Data Fusion and Automated Tools for Command Center Operations

## Example – Response to the terrorist attacks of 9/11

- Internal agency challenges
- Inter-agency coordination challenges

## Technology shortfall

- Situational awareness tools
- Decision support technologies
- Interoperability when not co-located
- Intelligence asset processing technologies
- *Success depends upon interoperability of multiple systems at differing levels of technological sophistication*



## Operator issues/concerns

*Note – S&T is seeking to support the mandate in the Safe Port Act of 2006, Section 108, to establish interagency operational centers for port security at all high-risk priority ports*

- Multiple sources of data → *timely, actionable* information
- Balancing agency-specific capability requirements with those of response partners



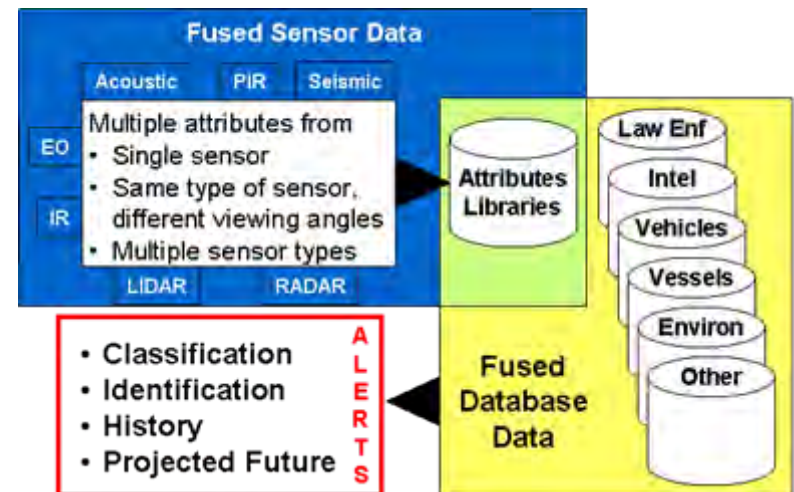
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Security**



# Data Fusion and Automated Tools for Command Center Operations (continued)

## Cross-functional values of the technology

- Primary customer – USCG
- “Port partners”: CBP, TSA, Port Authorities, local metropolitan police and fire departments
- Technical challenges inherent in this effort will impact all agencies with operational responsibilities in response to national emergencies, including terrorist events and natural disasters



## Future anticipated deployments

- Pilot program to assess, develop advanced situational awareness and collaboration tools
- Advanced fusion technologies



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Security

# Vessel Compliance

**Border enforcement personnel have limited tools to compel the compliance of suspect vehicles/vessels**

\* Border Security IPT crosswalk

## **Technology shortfall**

- Non-lethal
- Platform compatibility limitations
- Ability to stop multiple boat types
- Limiting collateral damage
- Leveraging technologies used to stop terrestrial vehicles

## **Operator issues/concerns**

- Compatibility with current CONOPS
- Training and maintenance requirements
- Maximum safety during follow-on interdiction by law enforcement personnel



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# Vessel Compliance (continued)

## Cross-functional values of the technology

- Primary customers – USCG, CBP, and ICE
- Seeking technologies deployable from multiple platforms: vehicles, vessels, and aircraft
- Ideal solutions will be deployable against both terrestrial and maritime threats



## Future anticipated deployments

- Investigate EMP approaches for vehicles and vessels
- Investigate and test feasibility of alternative technologies



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# Border Officer Tools & Safety

**Provides technologies that will enable border security law enforcement agents to perform their tasks in a border security operation with a higher level of safety**

## Technology shortfall

- Personal protective equipment (PPE)
  - Effectiveness against increasingly lethal ballistics
  - Weight restrictions
- Detection equipment
  - Handheld
  - “Through-the wall”
  - Humans and contraband



## Operator issues/concerns

- Suitable for use across with full spectrum of operational scenarios (PPE)
- Compatibility with DoD, DoJ, and state-of-the art industry equipment (PPE)
- Ease of use, minimal maintenance requirements (Detection equipment)



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# Border Officer Tools & Safety (continued)

## Cross-functional values of the technology

- Primary customers – USCG, CBP, and ICE
- Seeking solutions that will meet the requirements of all three agencies
- Success will result in the cross-cutting desire to:
  - reduce officer fatalities
  - reduce illegal entry of people and contraband



## Future anticipated deployments

- Improved ballistic protection meeting the needs of multiple DHS enforcement agencies
- Handheld inspection devices suitable for hidden compartments on ships or in vehicles



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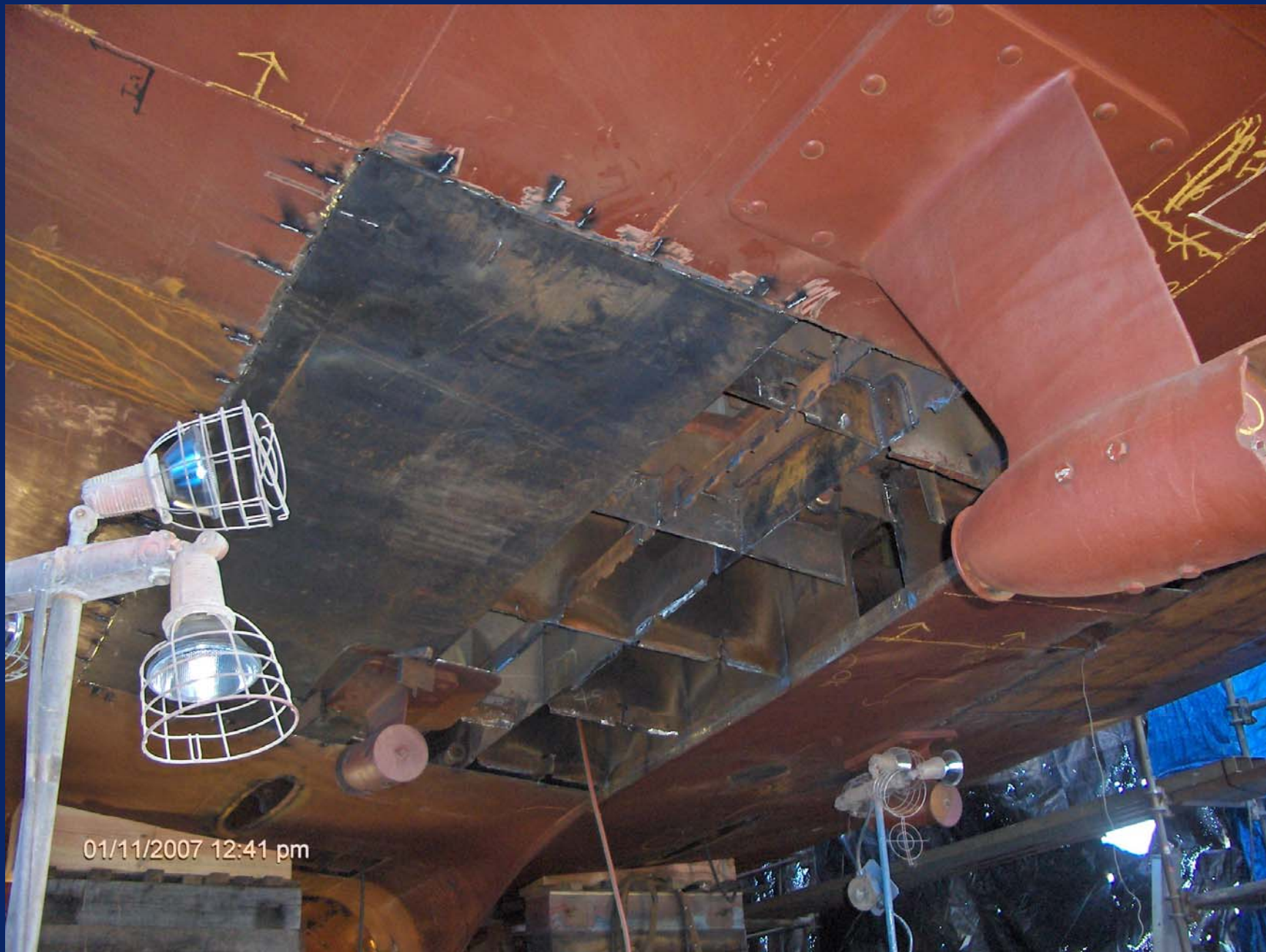
# Acquisition Directorate























01/11/2007 12:49 pm















































JAN 11 2007































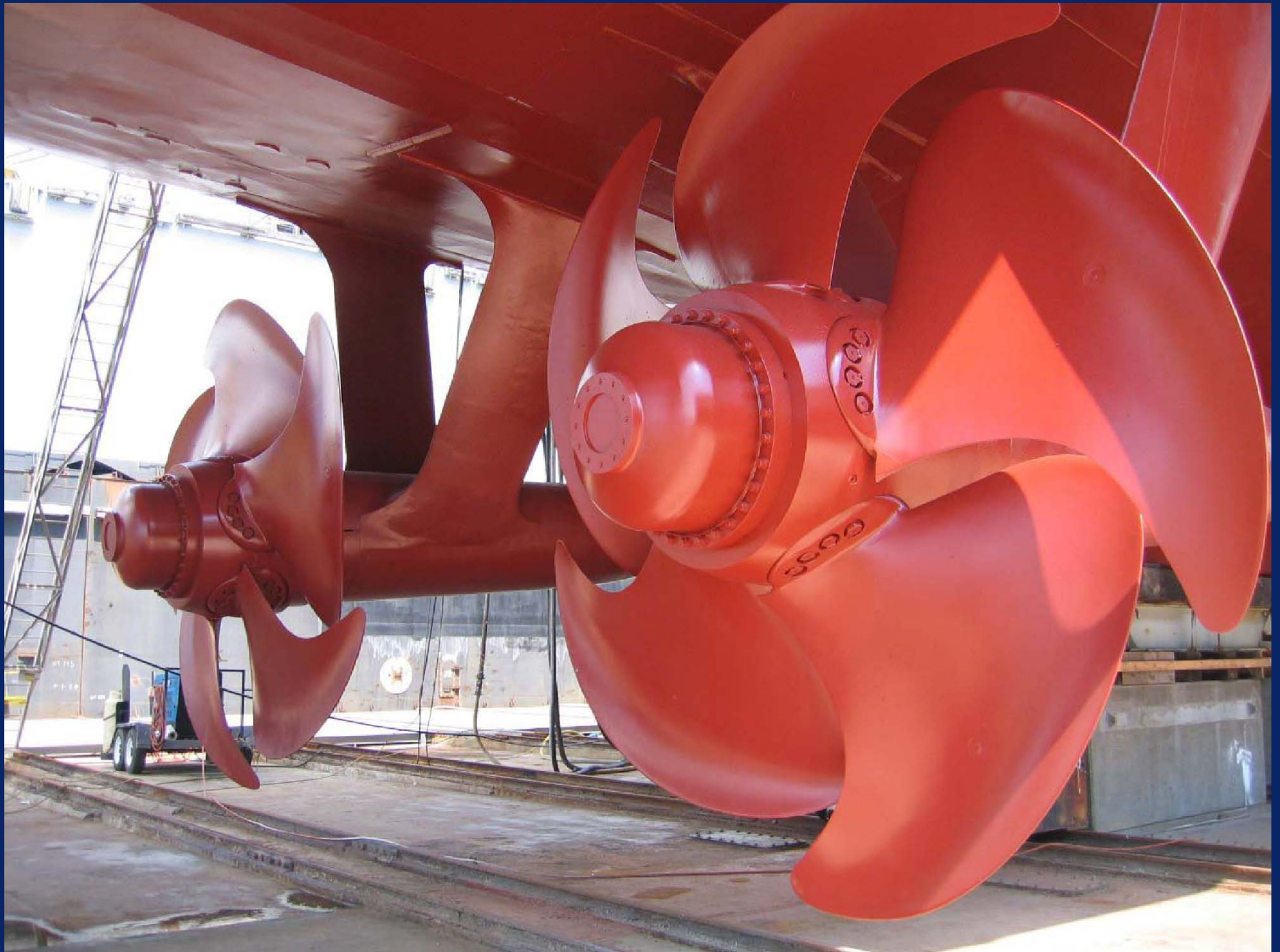






















































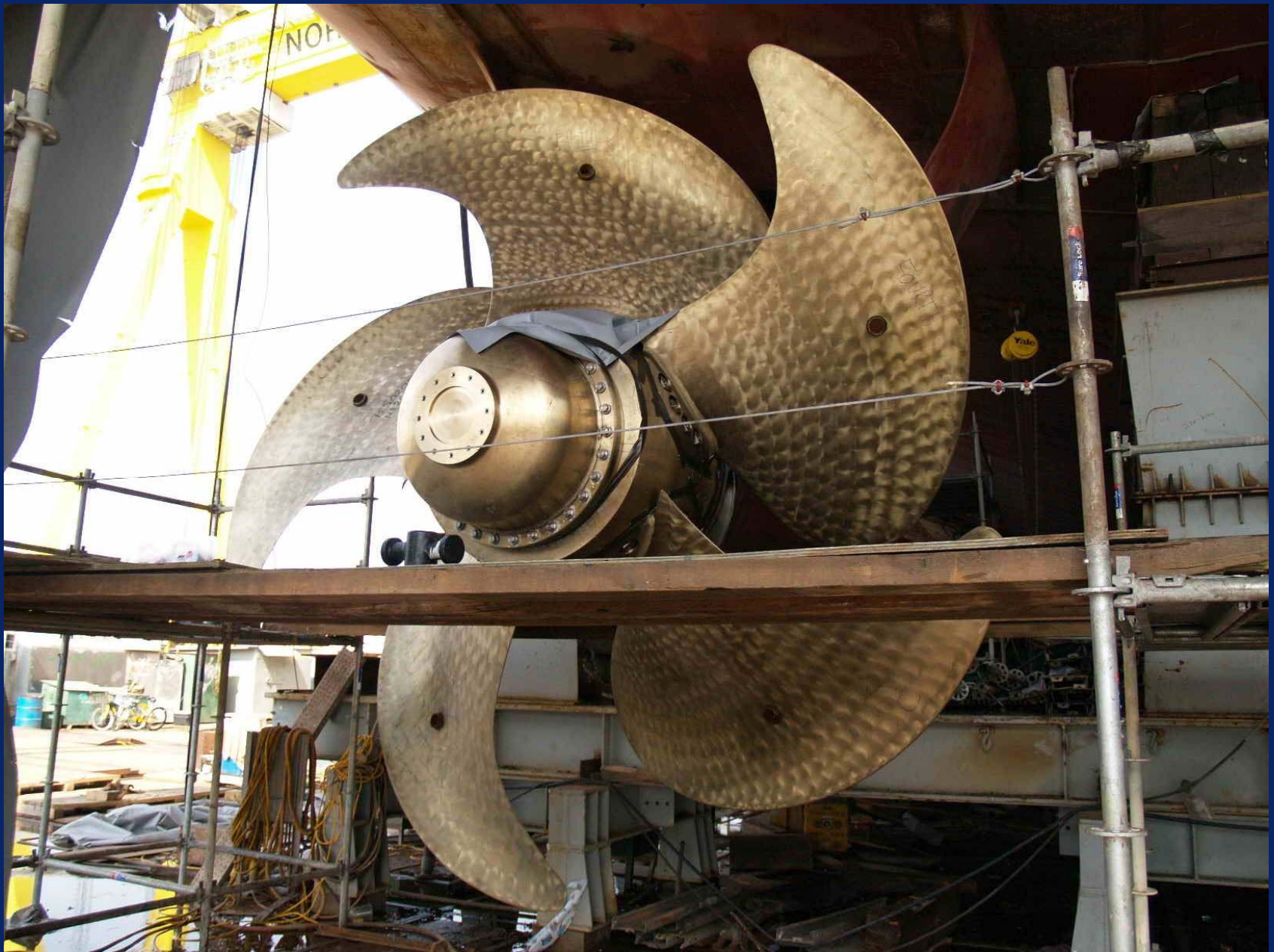




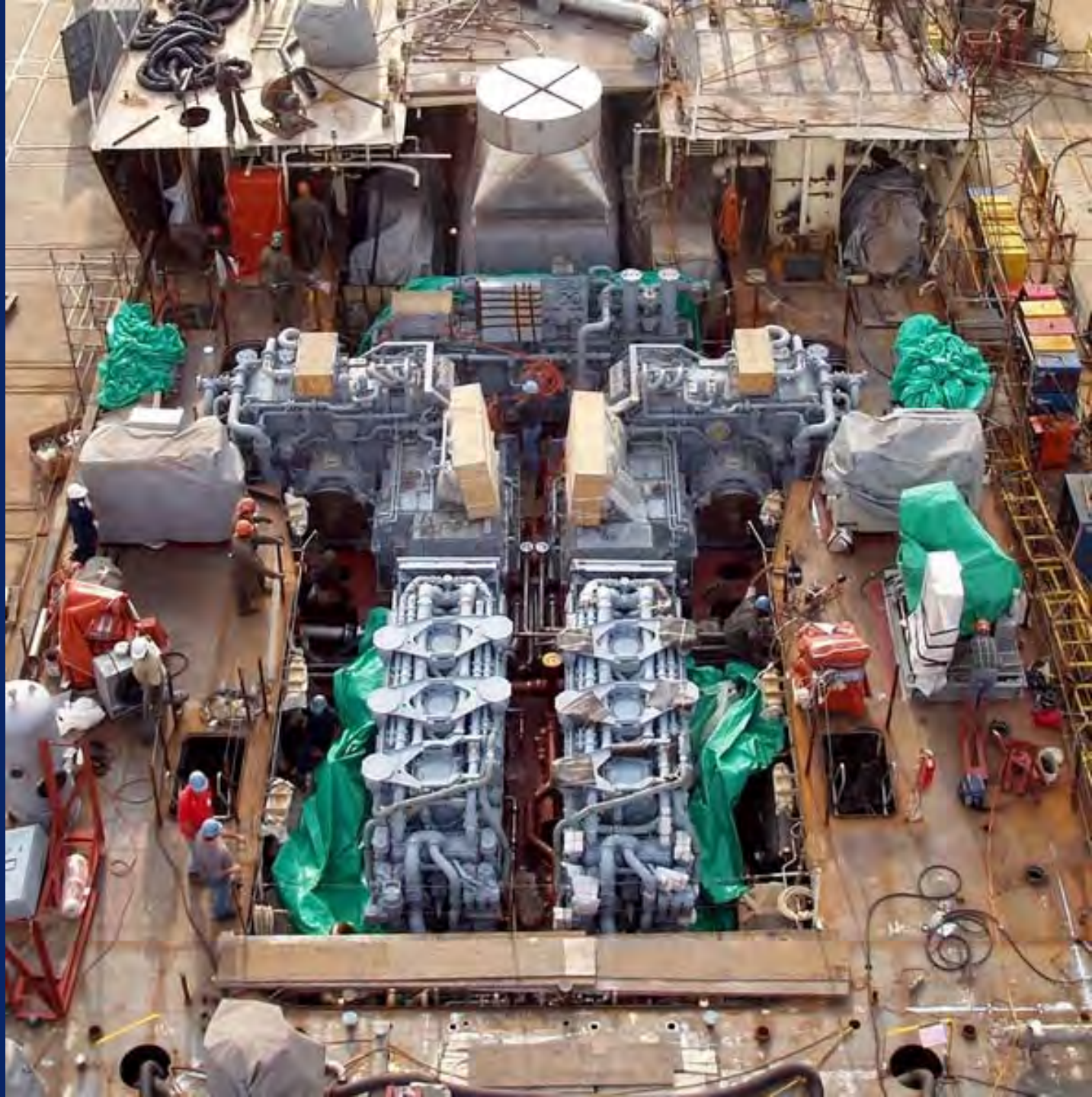










































# First Responder Technologies (R-Tech)

## Tech Clearinghouse TechSolutions

Greg Price

Science and Technology Directorate

Department of Homeland Security



**Homeland  
Security**

# TechSolutions

The mission of TechSolutions is to rapidly address technology gaps identified by Federal, State, Local, and Tribal first responders

- Field prototypical solutions in 12 months
- Cost should be commensurate with proposal but less than \$1M per project
- Solution should meet 80% of identified requirements
- Provide a mechanism for Emergency Responders to relay their capability gaps
  - Capability gaps are gathered using a web site ([www.dhs.gov/techsolutions](http://www.dhs.gov/techsolutions))
- Gaps are addressed using existing technology, spiral development, and rapid prototyping
- Emergency Responders partner with DHS from start to finish

*Rapid Technology Development*

**Target: Solutions Fielded within 1 year, at ~<\$1M**



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# TechSolutions Investments

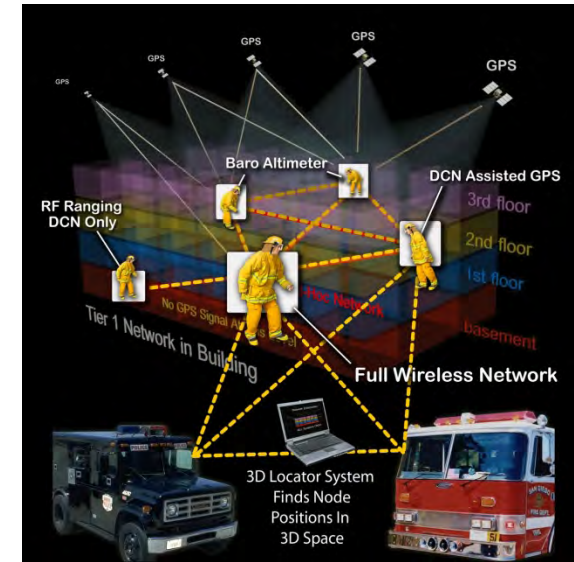
## Next Generation Breathing Apparatus



## Ocular Scanning Nerve Agents/Toxic Gases



## 3-D Location



## Fire Ground Compass



## Carrizo Cane – Bio Agent



## Biometric Identification







# TechSolutions Investments

## Patient Triage Mass Casualty Vital Sign Monitoring



## Interoperable Communications



## Seatbelt Safety

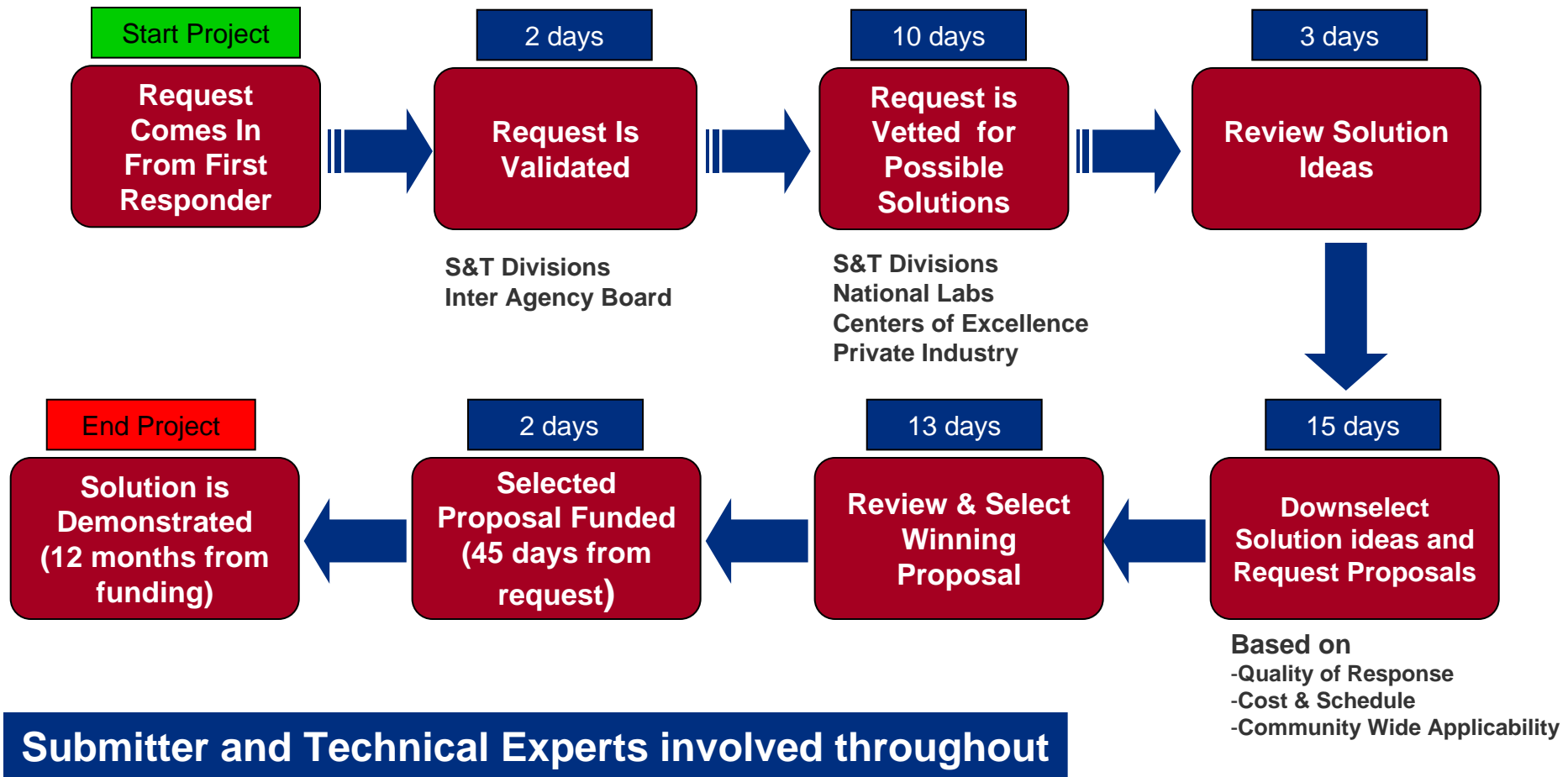


## Vehicle Mounted Chem/Bio Sensor Detection



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# TechSolutions Review Process



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# U. S. COAST GUARD INNOVATION



IMPROVING MISSION EXECUTION  
AND SUSTAINMENT





# *Creating USCG's Contribution to National MDA*

*RDML Rob Parker*

*Assistant Commandant for Capability*

*United States Coast Guard*

*29 October 2007*



# MDA Process



## Observables      Collect      Fuse      Analyze      Disseminate      Decide/Act

- Vessels
- People
- Facilities
- Cargo
- Infrastructure
- Sea lanes
- Threats
- Friendly forces
- Weather

- Sensors
- Operators & field personnel
- Intel Sources
- Open source
- Private sector data
- Law enf

- Tracks w/ tracks
- Data w/ data
- Tracks w/ data

- Anomaly detection
- Pattern recog & analysis
- Compare w/ rules
- Research tools

- Networks
- Displays (COP/UDOP)
- Command centers

- Strategic
- Operational
- Tactical

**MDA = Intelligence + Situational Awareness**



# *Developing MDA Capability*

***Collect***

***Fuse***

***Analyze***

***Disseminate***

**FIST**

**MFIC**

**NAIS**

**SCCS**

**SCCS**

**LRIT**

**MAGNET**

**AWW**

**VTs**

**COP/UDOP**

**IRVMC**

**WebCOP**

**Rescue 21**

**Homeport**

**Command 21**





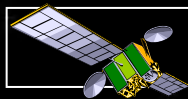
# *MDA Capabilities - Topics of Discussion*



- **Collection**
  - **Nationwide AIS**
  - **Long Range Identification & Tracking**
  - **Inland Rivers Vessel Movement Center**
- **Fusion & Analysis**
- **Dissemination**

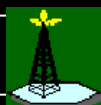


# *MDA Layered Coverage Areas*



## LRIT

- Global position reporting mandated by SOLAS regulations.
- 4 daily broadcasts mandated by IMO
- More than 160 contracting governments participating in LRIT.
- Track 40,000+ SOLAS Class vessels globally.
- Satellite based reporting.



## NAIS

- Nationwide network of towers & transceivers.
- VHF radio-based (line of sight technology), self-generated vessel reports mandated by IMO/SOLAS regulations.
- Conceptually similar to aircraft transponders.
- Provides AIS data feed to CG enterprise data stores.
- Inside 50 NM: near real time reports (seconds/minutes).
- Inside 2000NM: less frequent satellite based coverage.



## Command 21

- SCC monitors vessel behavior with radars and cameras.
- Corroborate vessel behavior with actions advertised in LRIT/NAIS.
- Joint planning and operations tools.
- Real-time operational decision support.
- Covers critical port/coastal approaches to 24NM.
- Ingests fused intel products from systems like MAGNet and other Situational Awareness data.

Foreign  
Port

US Port

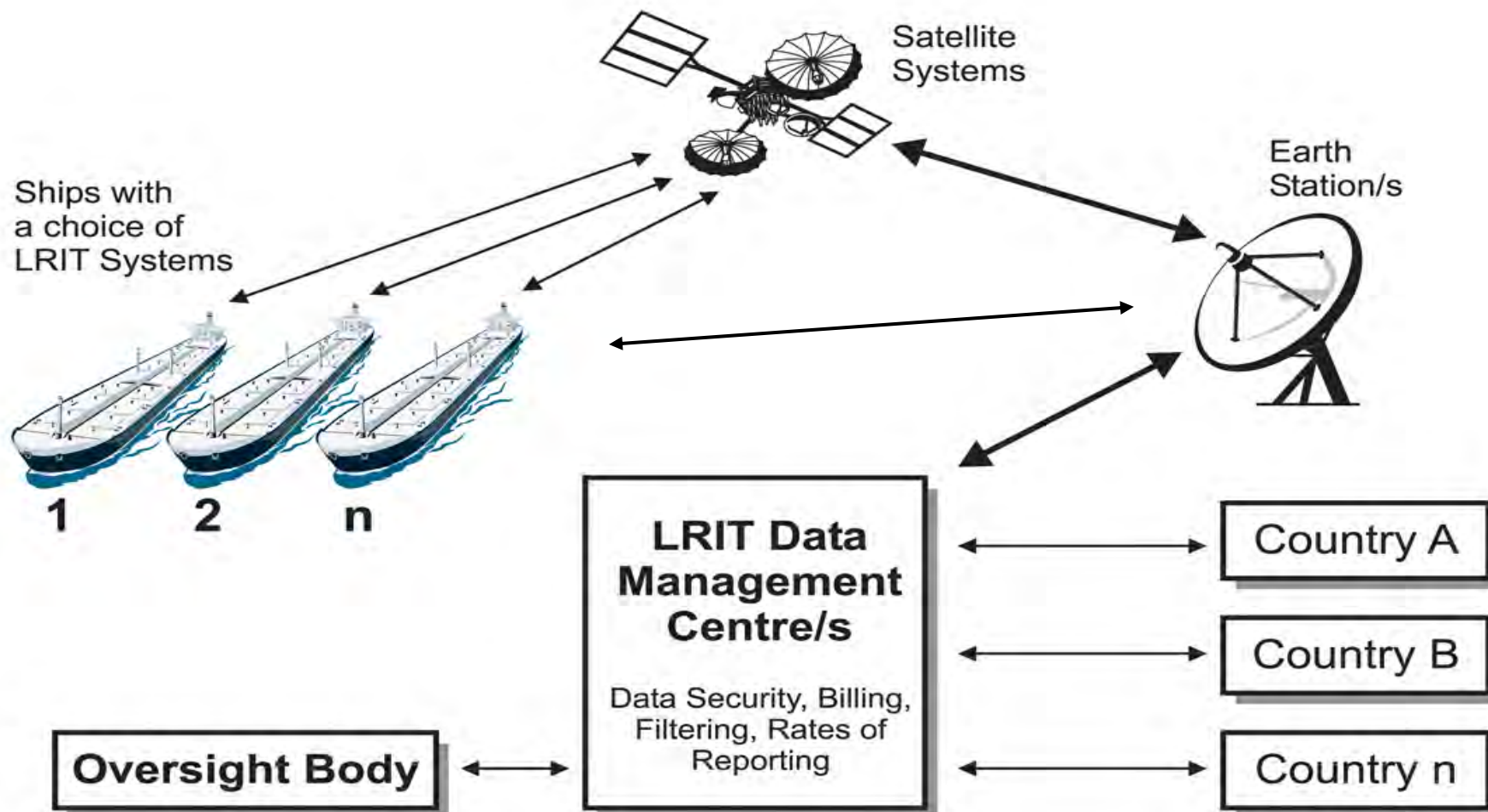
All 3 tracking systems feed data to CG enterprise data warehouse for strategic fusion.

Enterprise  
CG



# *LRIT Concept*

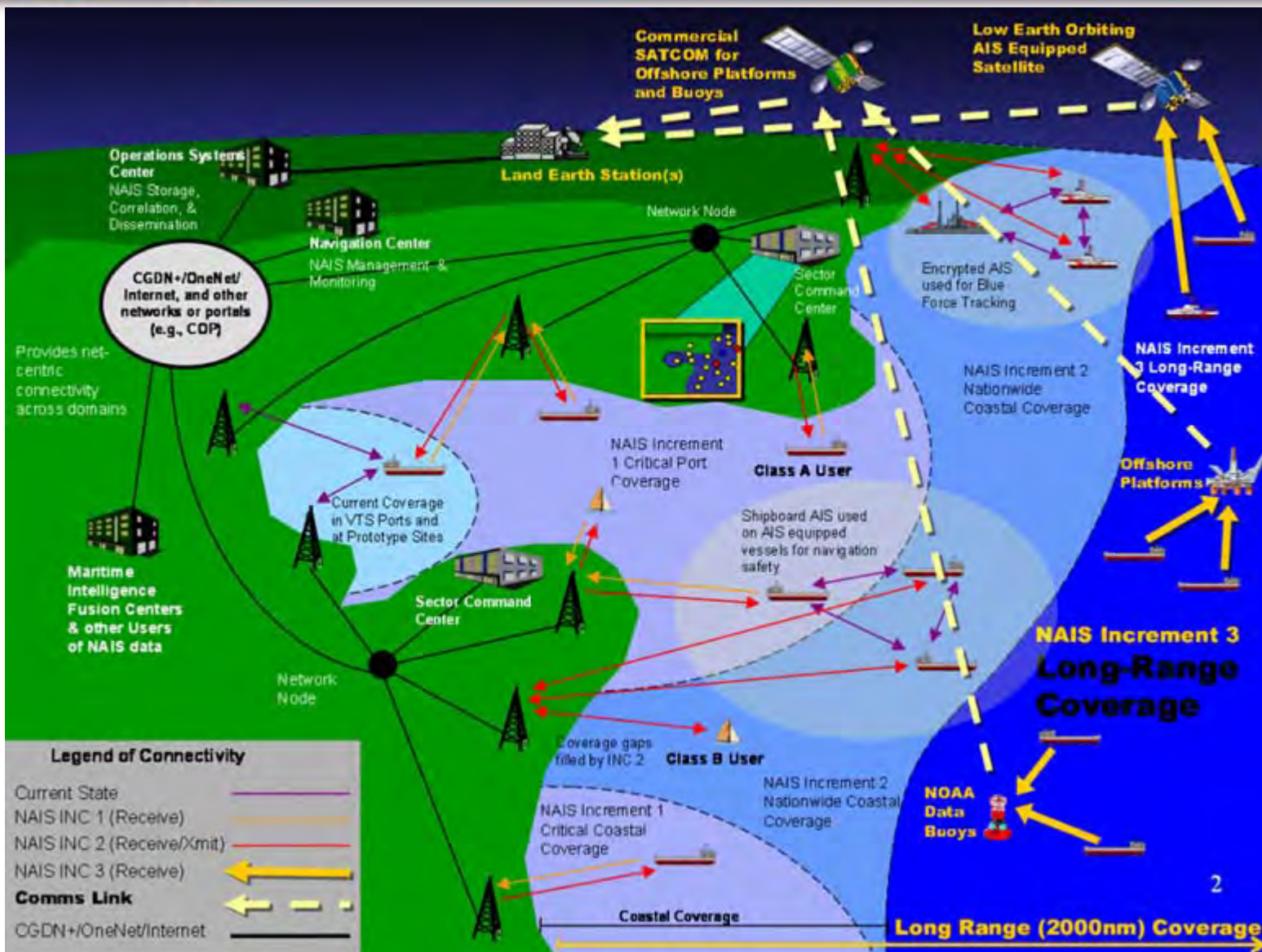
(Used with Permission of Inmarsat)







# *Future NAIS Operational View*



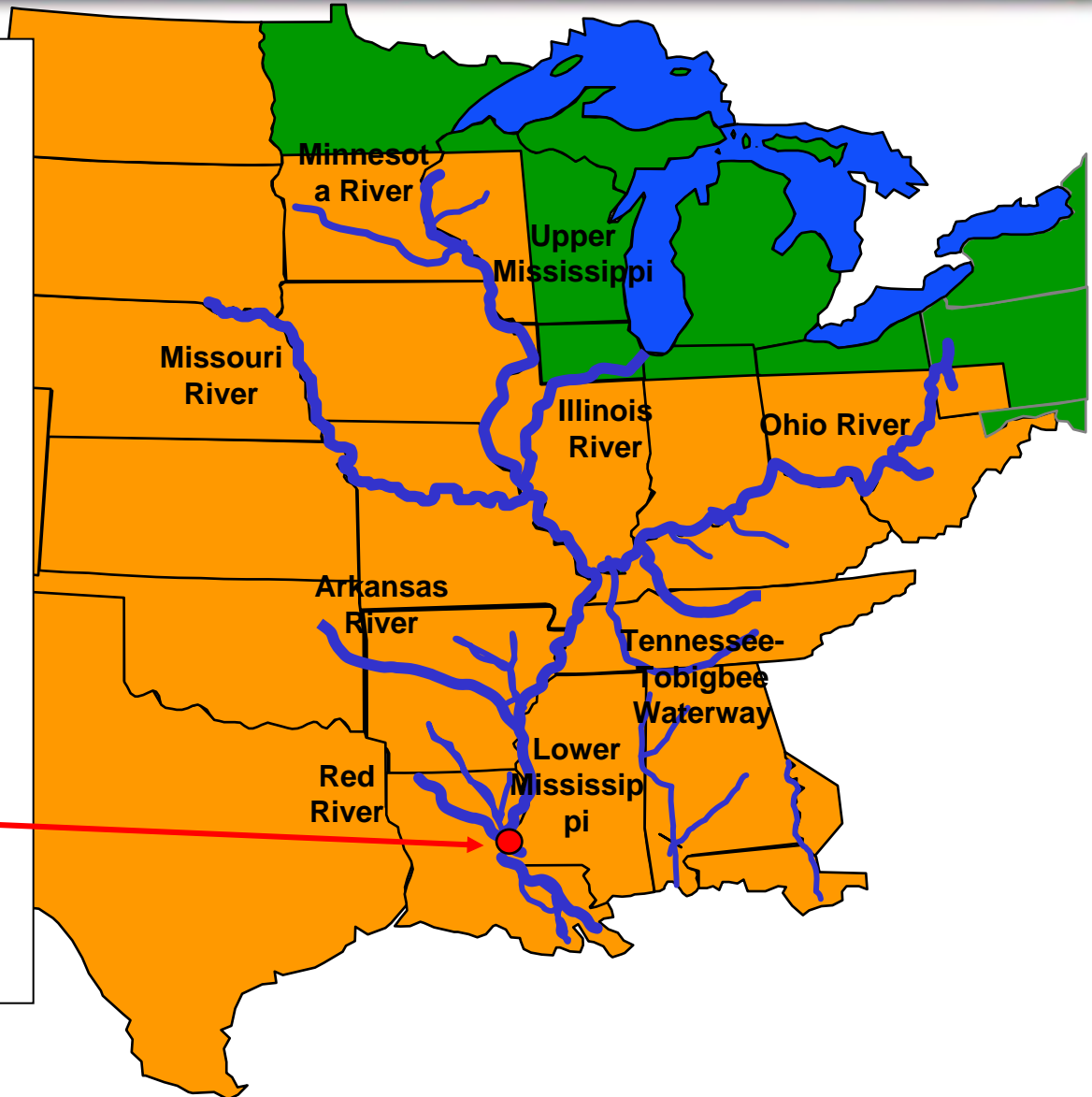


# *Inland Rivers Vessel Movement Center*



## Reporting AOR

- 10,300 miles of inland rivers
- Tracks all CDC movements and status changes
- Feeds track data to the COP via MISLE
- Ends at Mile Marker 235 near Baton Rouge, LA





# *MDA Capabilities - Topics of Discussion*



- **Collection**
- **Fusion & Analysis**
  - **Maritime Awareness Global Network**
  - **Common Operational Picture / User Defined Operational Picture**
- **Dissemination**





# *Maritime Awareness Global Network*



## **MAGNet:**

- a multi-faceted intelligence capability;
- built on an integrated, multi-level data repository, dissemination vehicle, and decision support system;
- that extracts and combines information from government, commercial and private sector sources;
- delivers strategic and tactical intelligence to the USCG and government agencies at operational and policy levels;
- that enhances U.S. maritime security and advance all USCG missions...







# *MDA Capabilities - Topics of Discussion*



- **Collection**
- **Fusion & Analysis**
- **Dissemination**
  - **Command Centers**



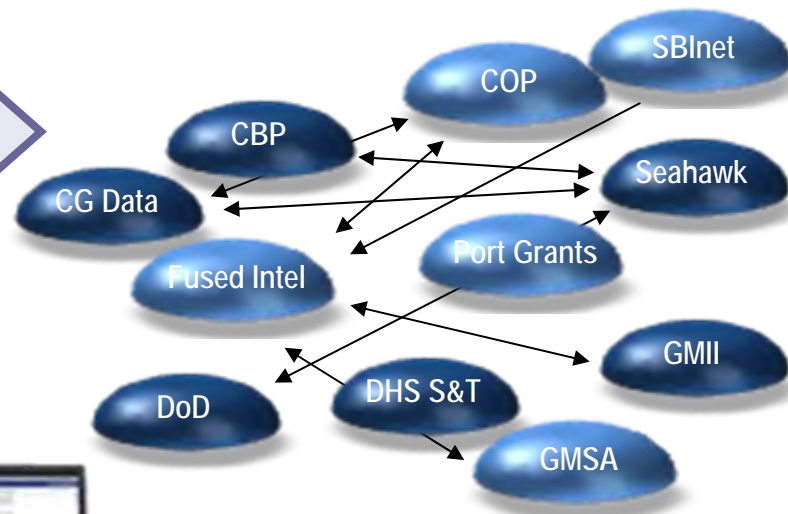


# Command Centers

See

Understand

Share



Turning Awareness Into *Action*

# Questions?





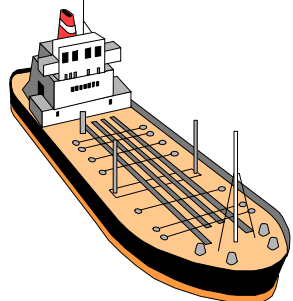
# *AIS Via Commercial LEO Satellite*



AIS signal processed onboard satellite – remove data to lessen bandwidth, meet reporting requirements, etc.

- **Launch scheduled for Dec 2007**

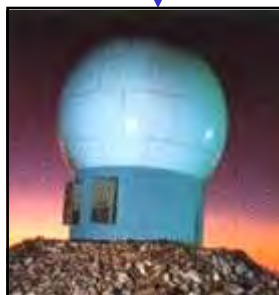
AIS signal received by satellite – no AIS transmission from satellite



**Vessel equipped with AIS**



Processed AIS data sent from satellite to GES via ORBCOMM data link



**Gateway Earth Station (GES)**

AIS data routed through NCC – quality check, satellite maintenance, etc.



**Network Control Center (NCC)**

USCG receives data and incorporates into appropriate command and control (C2) systems), distributes to other users as appropriate



**USCG Data Network – distribute to end users**





# *Field Intelligence Support Teams*



## FISTs:

- 30 ports have dedicated FISTs
- Provides port-level intelligence collection and reporting
- Liaison with Federal, state, local, tribal, and industry partners
- Provides better port-level threat assessments
- Report on activities in foreign ports using information gathered from ship master and crew interviews
- Source development and lead generation
- Generate Field Intelligence Reports (FIRs)



# *Maritime Intelligence Fusion Centers*



- Mission: Timely, Fused, Actionable Intelligence for...
  - Coast Guard Operational Commanders
  - DoD & National Intelligence Community
  - Federal, State, and Local Law Enforcement Partners
- Intelligence Program Management for each CG Area and 24x7 Intelligence Watch Center
- Provides Intel Analysis and Collection for the following mission areas:
  - Terrorism
  - Targeting (Vessel Screening)
  - Transnational Crime (Migrants / Drugs / Piracy)
  - Living Marine Resources (LMR)
  - Geo-Political
- MIFC Locations:
  - Pacific Area (MIFC PAC) – Alameda, California
  - Atlantic Area (MIFC LANT) – Virginia Beach, Virginia



# Acquisition Directorate

---

## Research & Development Center

# Maritime Domain Awareness Data Sharing

Jay Spalding, U. S. Coast Guard  
Presentation to USCG MDA Day  
29 October 2007





# Topics

---

Data Sharing Overview

Spiral 1 and 2 Update

Spiral 3 Planning

Discussion



# Current Environment

---

**Crises create unanticipated data needs...**

**Look to recent events:**

- 2000 Terrorist Attack on USS Cole in Yemen
- 9/11/2001 Terrorist Attack in USA
- 2004 Tsunami in Southeast Asia
- 2005: Hurricane Katrina Devastation in USA

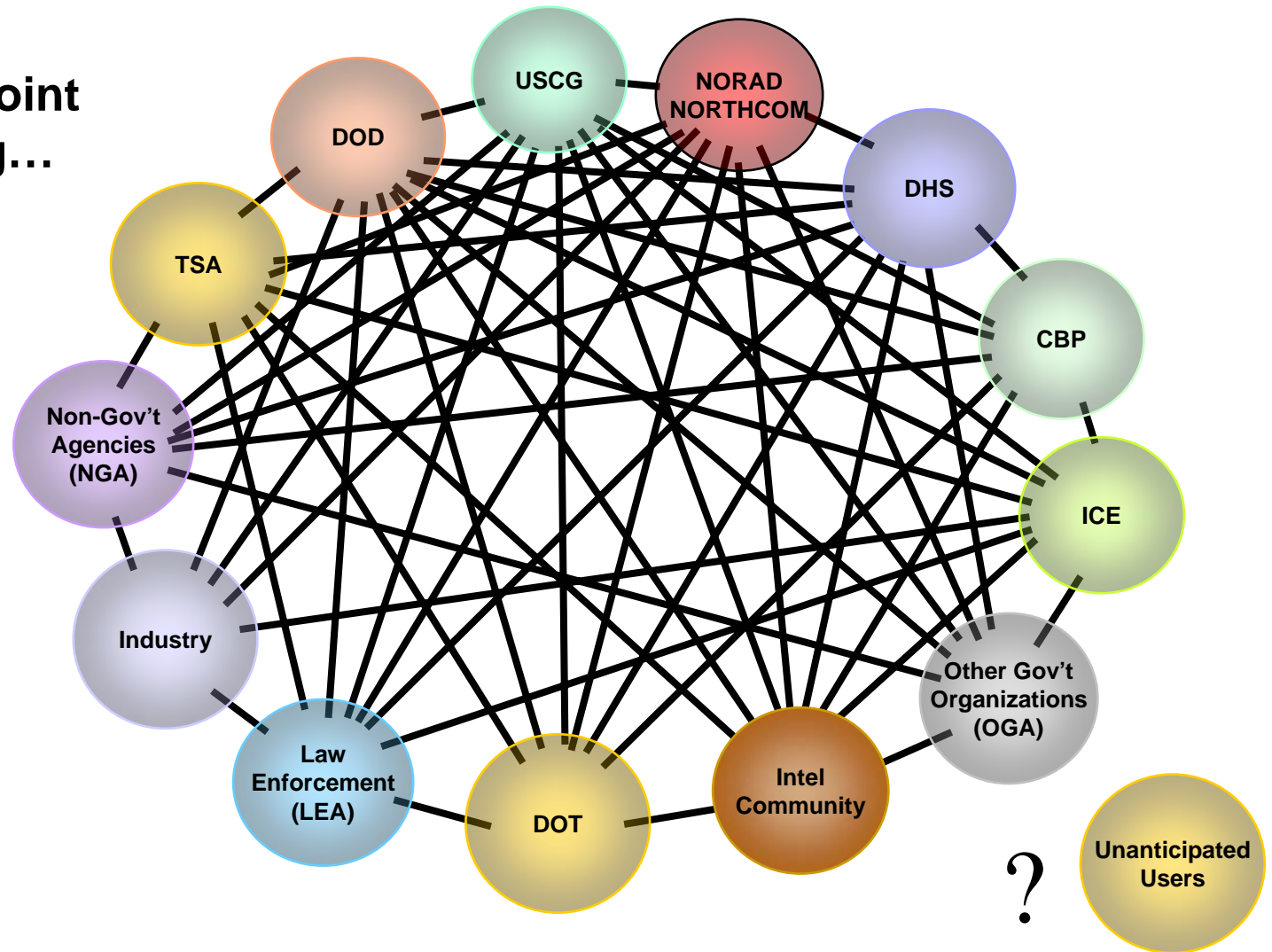
**Intergovernmental Federal Cooperation is essential**

**Current infrastructure is not responsive...**



# The Current Paradigm

...point-to-point  
data sharing...





# Purpose

---

Wanted – Net-centric data sharing for the maritime community

## Benefits :

Scalable and adaptable to the community

Flexible and agile decision-making and execution

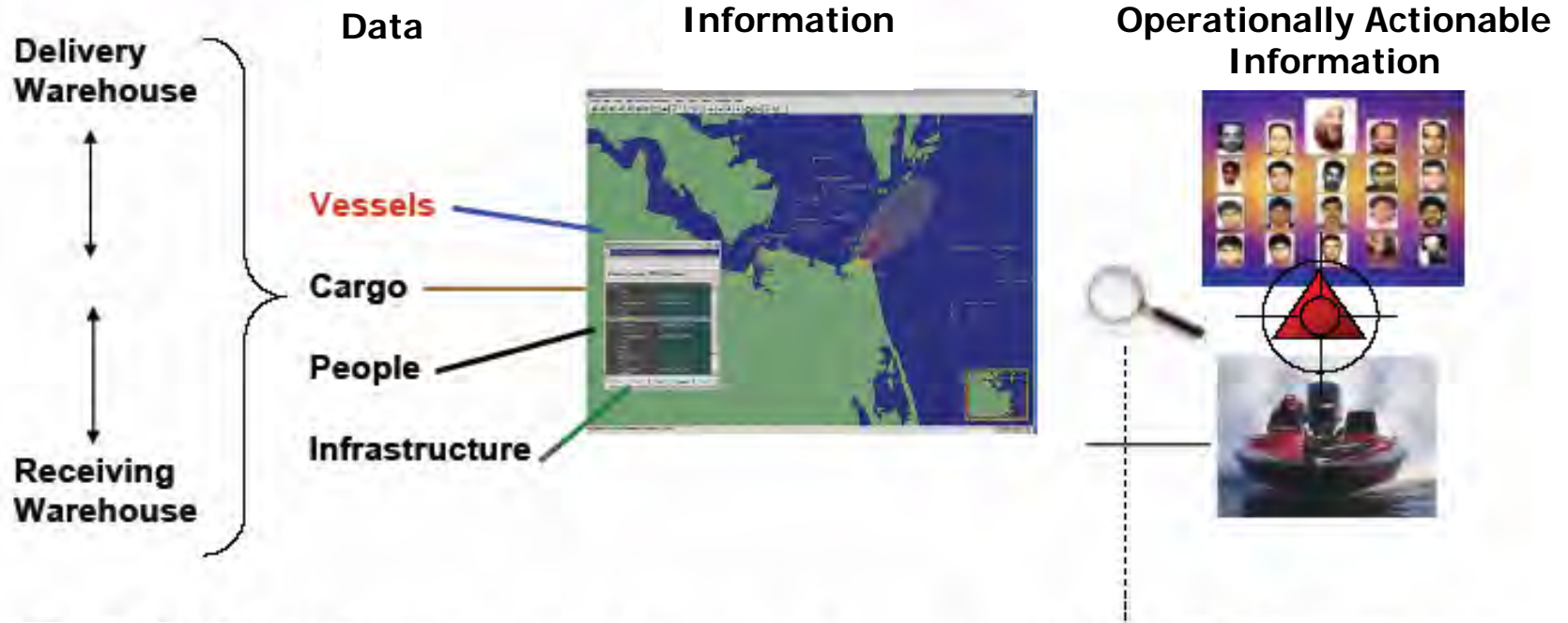
Efficient in cost, schedule, and performance

Improves community partnerships across boundaries



# Maritime Fusion Challenge

**Current Tasking: Corresponds with MDA Essential Tasks: Find, ID, track**



Gather data from disparate sources:

- Commercial
- Law Enforcement
- Foreign Partners
- Military

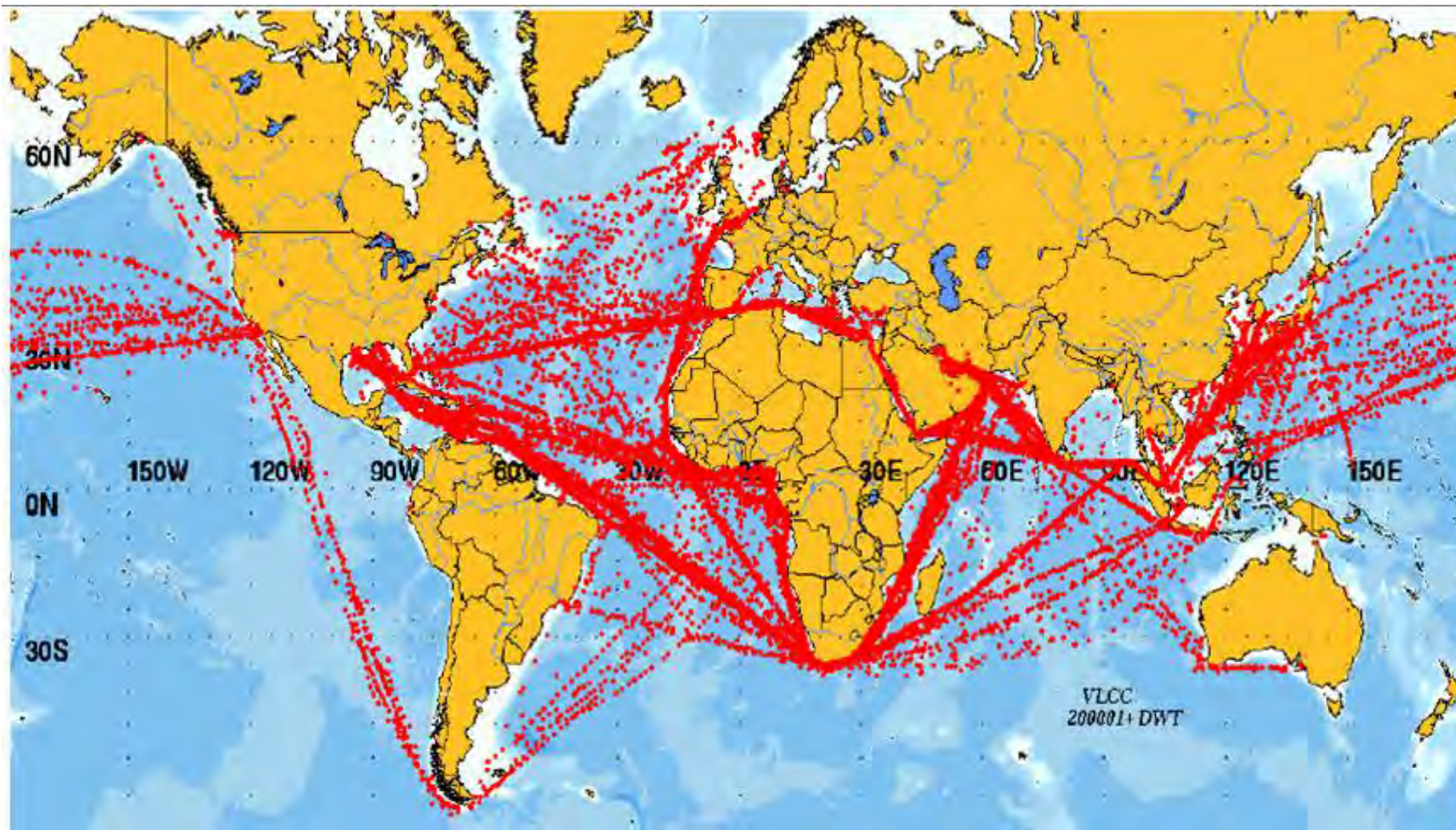
Develop Maritime Situational Awareness

- Reconcile data sensitivities
- Fuse data into information
- Display for info for human understanding (User-Defined Operational Picture - UDOP)

Establish Maritime Situational Awareness:

- Understand the "normal" situation
- Recognize the anomalies
- Direct the operational actions

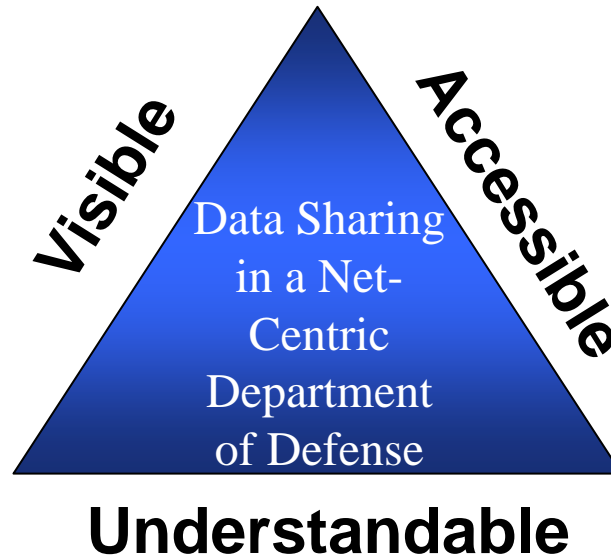
# Global Maritime Situational Awareness





# Communities of Interest

**A collaborative group of people that must exchange information in pursuit of its shared goals, interests, missions, or business processes and therefore must have a shared vocabulary for the information it exchanges ... DOD Directive 8320.2**



# Services-Oriented Architecture (SOA)

---

## Net-Centric Enterprise Services (NCES)

- Developed by Defense Information Services Agency (DISA)
- SOA for Department of Defense agencies & users
- Allowances made for non-DoD agencies & users

## Homeland Security Information Network (HSIN)

- Developed by Department of Homeland Security
- Portal for non-DoD agencies & users

## Coalition Warrior Interoperability Demonstration (CWID) and Trident Warrior (TW)



# Spiral 1 & 2 Overview

---

## Spiral 1

- **Kickoff 22-23 February 2006**
- **Unclassified AIS Net-centricity (MDA \$300K, CG-66 \$600K)**
  - 4 Publishers in DoD, DHS, DOT
  - 4 Subscribers (UDOP) from DoD, DHS, DOT
- **NCES, HSIN Infrastructures Leveraged**
- **DoD CIO Demo at ONI – 17 Oct 2006**
- **N6 Demo Pentagon – 14 Dec 2006: CG-01 Participation**

## Spiral 2

- **Funded by USN N6 & USCG NAIS Program**
- **Adds Capability Enhancements & Data Services**
  - Enhance Security, Low-bandwidth users, High-Data Publishers, New publishers & data types (e.g., METOC, Imagery)
  - Historical Archiving, Anomaly Detection, Data Augmentation

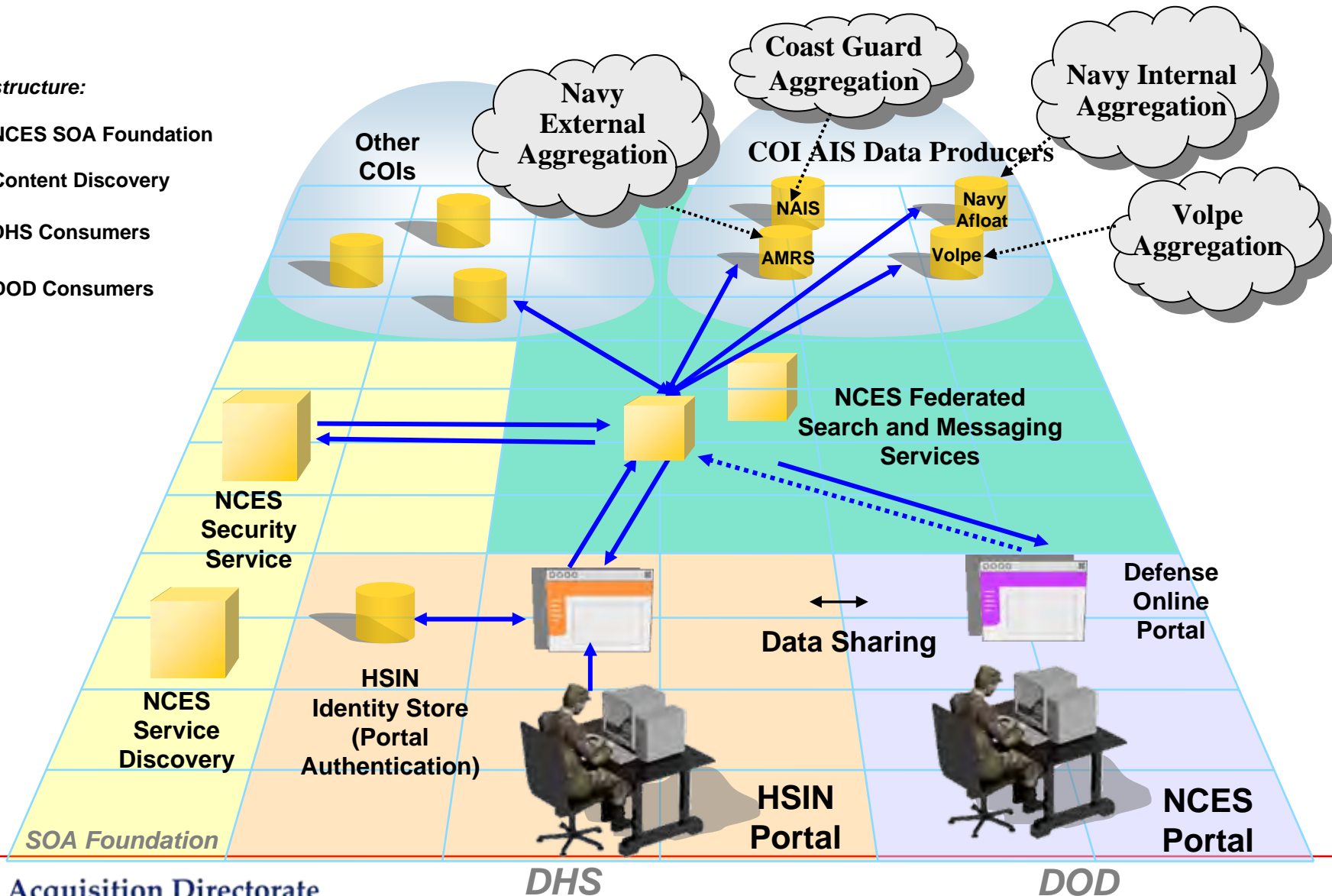




# High-Level Pilot Architecture

## Infrastructure:

- NCES SOA Foundation
- Content Discovery
- DHS Consumers
- DOD Consumers



# Legacy Viewer (iMap Data)

Maritime Domain Awareness Data Sharing COI - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address <https://beta.imapdata.com/ims/DefaultView.aspx>

Google

Logout MapData

Tools Help What's New

Demographics  
Detection Systems  
Education  
Electric Power  
Emergency Management  
Federal Lands  
Fuels  
Geography  
Government  
Imagery  
Impact Analysis  
Law Enforcement  
Media  
Military  
Natural Gas  
Natural Hazards  
Nautical Charts  
Nuclear  
Oil  
Petroleum Infrastructure  
Political  
Ports  
New York City, NY  
Postal/Shipping  
Religion  
Telecommunications  
Transportation  
Water  
Weather  
Bookmarks

Ports and Waterway Features  
conveyance  
Major Roads  
Streets  
Streets

Name: GUY\_V\_MOLINARI  
MMSI: 366952790  
IMO Number: 0  
Speed Over Ground: 14.7  
Course Over Ground: 226  
Destination: WHITEHALL TERMINAL  
E.T.A.: Oct 13 2006 12:00AM  
Latitude: 40.6914 Longitude: -74.0269

conveyance : Name: GUY\_V\_MOLINARI-MMSI: 366952790-IMO Number: 0-Speed Over Ground: 14.7-Course Over Gro

1 : 35,236 3.91 x 4.17 (mi)

start 2 Internet Ex... Situational Awa... GES Portal - NC... AIM 2 Microsoft Of... Gulf Coast.bmp... My Pictures 1:35 PM



# COI Collaboration site

Home - Maritime Domain Awareness Data Sharing Community of Interest (MDA DS COI) - Microsoft Internet Explorer provided by Unit

File Edit View Favorites Tools Help

Back Forward Stop Reload Home Search Favorites Links

U.S. COAST GUARD Type in a keyword Search Highlight Zip Code: ELEVATED Tools Address

Home Documents and Lists Create Site Settings Help Tutorials MySite Up to GES Portal

## Maritime Domain Awareness Data Sharing Community of Interest (MDA DS COI)

### Home

The MDA DS COI is an initiative focused on the establishment of an MDA information-sharing capability employing net-centric applications and services among the full spectrum of MDA stakeholders. This includes the creation of a MDA community defined data standard to support net-centric information sharing by making the MDA data visible, accessible, and understandable. The MDA DS COI is governed by and composed of an Executive Board, Steering Committee, and several working groups.

The MDA DS COI recently delivered its Spiral 1 Pilot capability, which demonstrated a global UNCLAS MDA Data Sharing net-centric capability based initially on multiple Automatic Identification System (AIS) data producers adopting a common (MDA Community) vocabulary and schema. The MDA DS COI Pilot Spiral 1 capability utilized the DHS Homeland Security Information Network (HSIN) and the DoD Net-Centric Enterprise Services (NCES) Early Capability Baseline (ECB) to offer Data Producers and Consumers a single/common seamless methodology for exposing, discovering, publishing and subscribing to UNCLAS MDA data.

The MDA DS COI has begun the planning phases for its Spiral 2 Pilot capability, which will involve maintaining the existing Data Producers and Consumers, integrating additional Data Producers and Consumers, and creating value-added services on top of the existing information-sharing capability that leverage AIS data to provide enhanced functionality for MDA stakeholders.

#### Announcements

There are currently no active announcements. To add a new announcement, click "Add new announcement" below.

- Add new announcement

#### Shared Documents

Type	Name	Modified By
Document	MDA DS COI NCES Lessons Learned (1500-8MAR07) (2)	Adam White
Document	MDA Overview (1500-19DEC06)	Richard Baker
Folder	Related National MDA Documents	Adam White
Folder	DoD Directives	Adam White
Folder	NCES Information	Richard Baker
Folder	MDA DS COI Spiral 2	Richard Baker
Folder	MDA DS COI Spiral 1	Richard Baker
Folder	MDA Training	Adam White

- Add new document

#### Contacts

Last Name	First Name	Business Phone	E-mail Address
Baker	Rich	703-526-0001	rich.baker@solers.com
Bojanowski	Beth	619-297-2905	bbojanow@fgm.com
Gants	Bob	703-526-0001	Robert.Gants@solers.com
MDA DS COI Technical Support Team (TST)			
Raney	Christopher	(619)-553-5282	raneyc@spawar.navy.mil
Rhiddlehoyer	Trev	703-526-0001	trev.rhiddlehoyer@solers.com

#### Events

There are currently no upcoming events. To add a new event, click "Add new event" below.

- Add new event

#### Tasks

Title Assigned To

There are no items to show in this view of the "Tasks" list. To create a new item, click "Add new item" below.

- Add new item

#### Links

- Net-Centric Enterprise Services (NCES) Homepage
- DoD Metadata Registry and Clearinghouse
- Community of Interest (COI) Toolkit
- Community of Interest (COI) Directory
- Net-Centric Enterprise Services (NCES) User Workspace



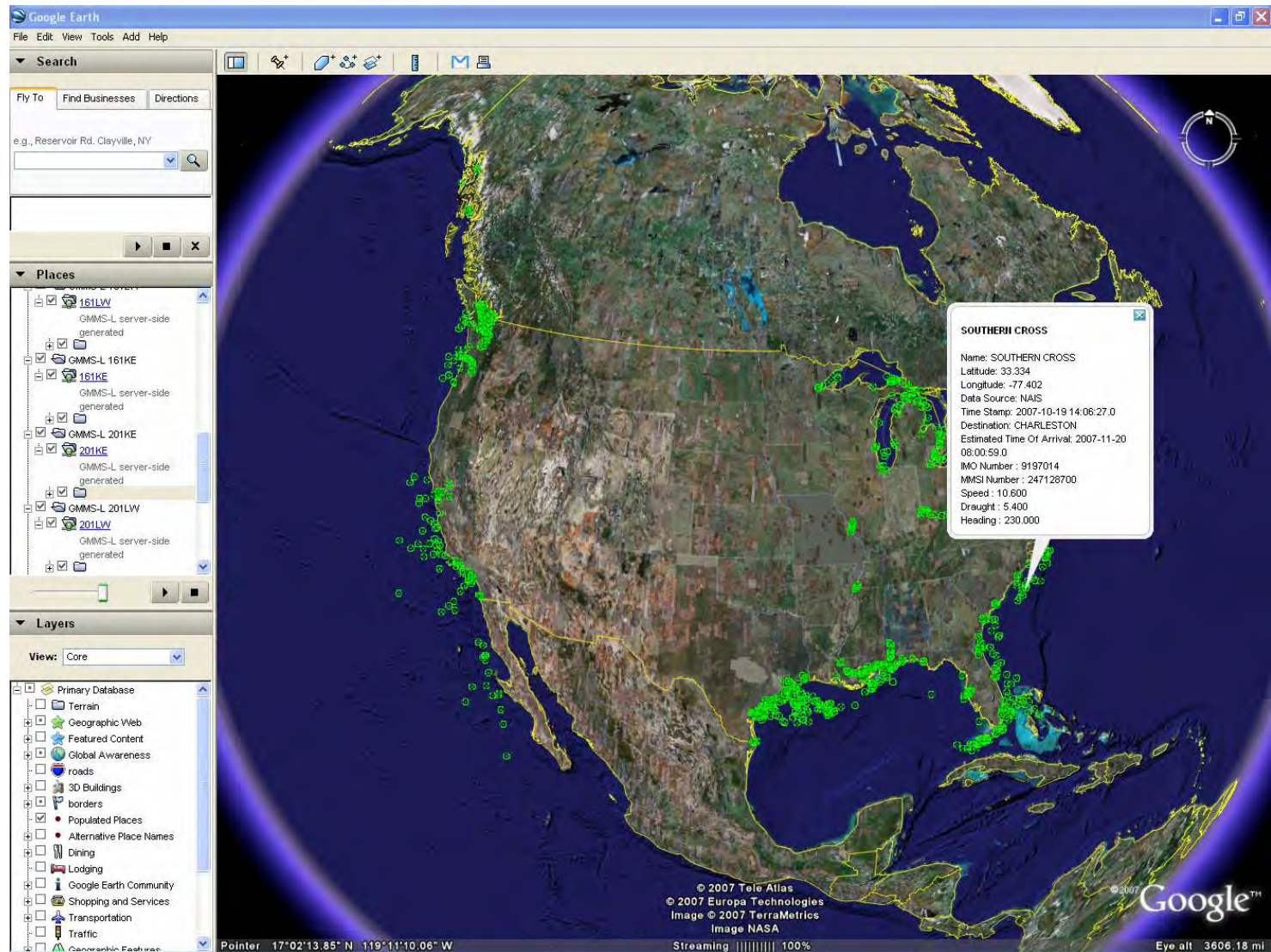



# Site for Developers & Users

The screenshot shows a Microsoft Internet Explorer browser window displaying the Maritime Domain Awareness Data Sharing Community of Interest (MDA DS COI) website. The browser's address bar shows the URL "Maritime Domain Awareness Data Sharing Community of Interest (MDA DS COI) - Microsoft Internet Explorer provided by United Stat". The website features a navigation menu on the left with links such as "WHO WE ARE", "GOOGLE MAPS MEDIATION SERVICE", "GOOGLE EARTH MEDIATION SERVICE", "COI DEVELOPERS INFORMATION PAGE", "COI DATA PROVIDERS INFORMATION PAGE", "METRICS & REPORTING INFORMATION PAGE", and "CONTACT". The main content area is titled "Maritime Domain Awareness Data Sharing Community of Interest (MDA DS COI)" and includes a welcome message and a link to view MDA Data with Google Maps. A diagram titled "MDA DS COI" illustrates the data flow from various sources (NCE, NCEB, NCEC, NCEM, NCEP, NCEQ, NCEW, NCEX) through the NCEC Messaging Service to the UDOP (User Data Operations) and the Mediation Service. The diagram shows a funnel-like structure where data from multiple sources is processed and then distributed to users via the Mediation Service.

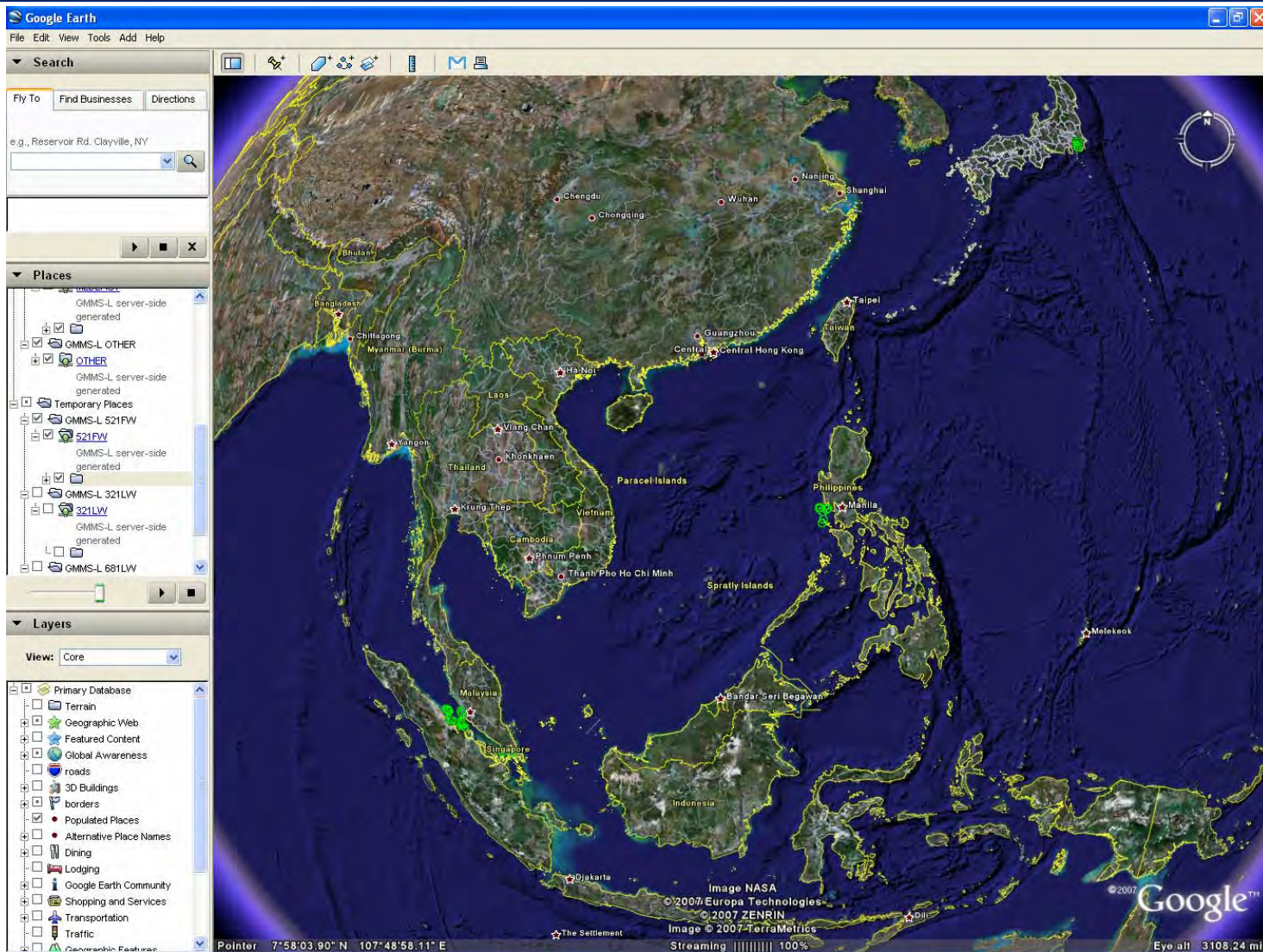


# USCG NAIS



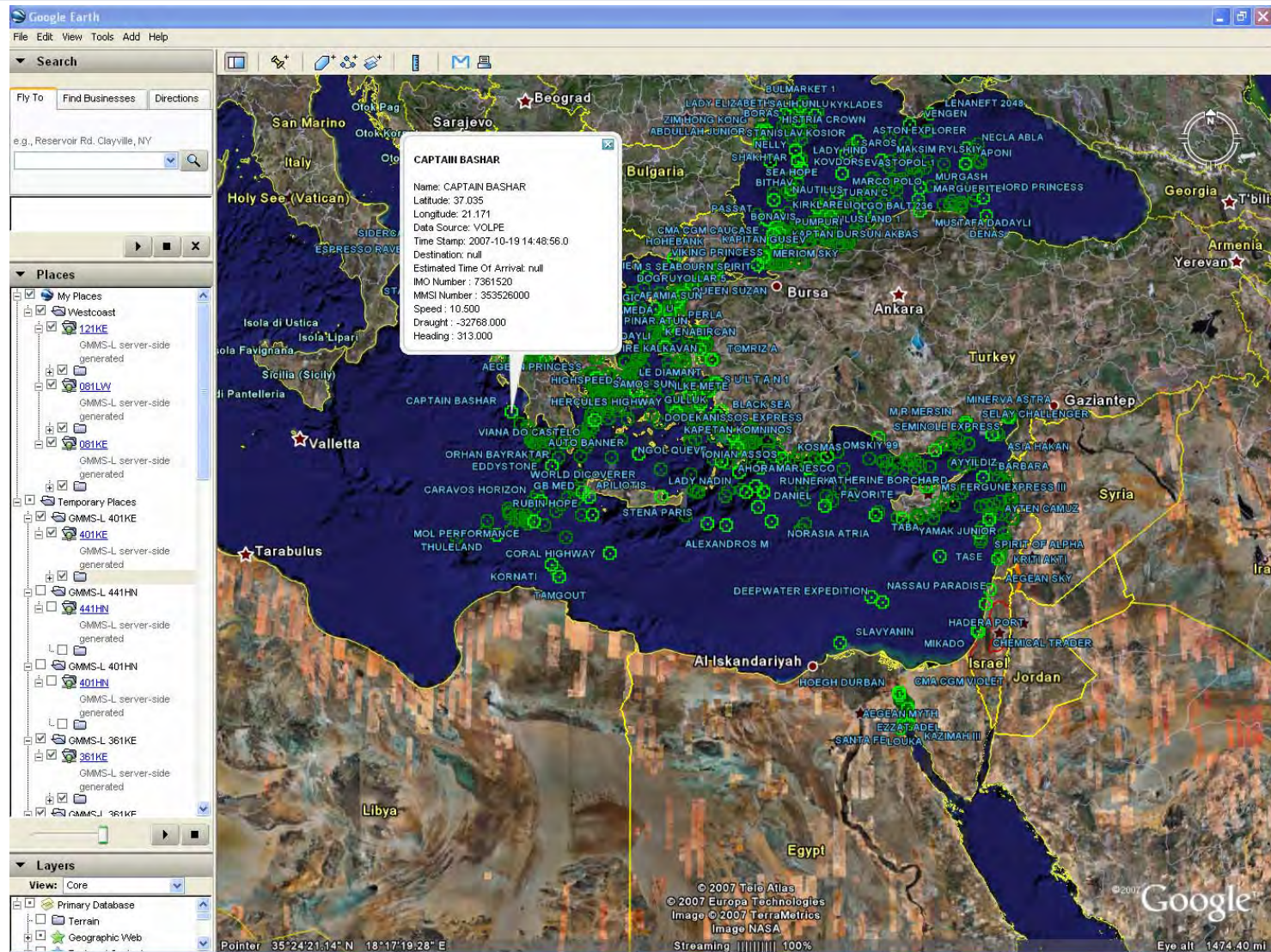


# NAVY & AMRS



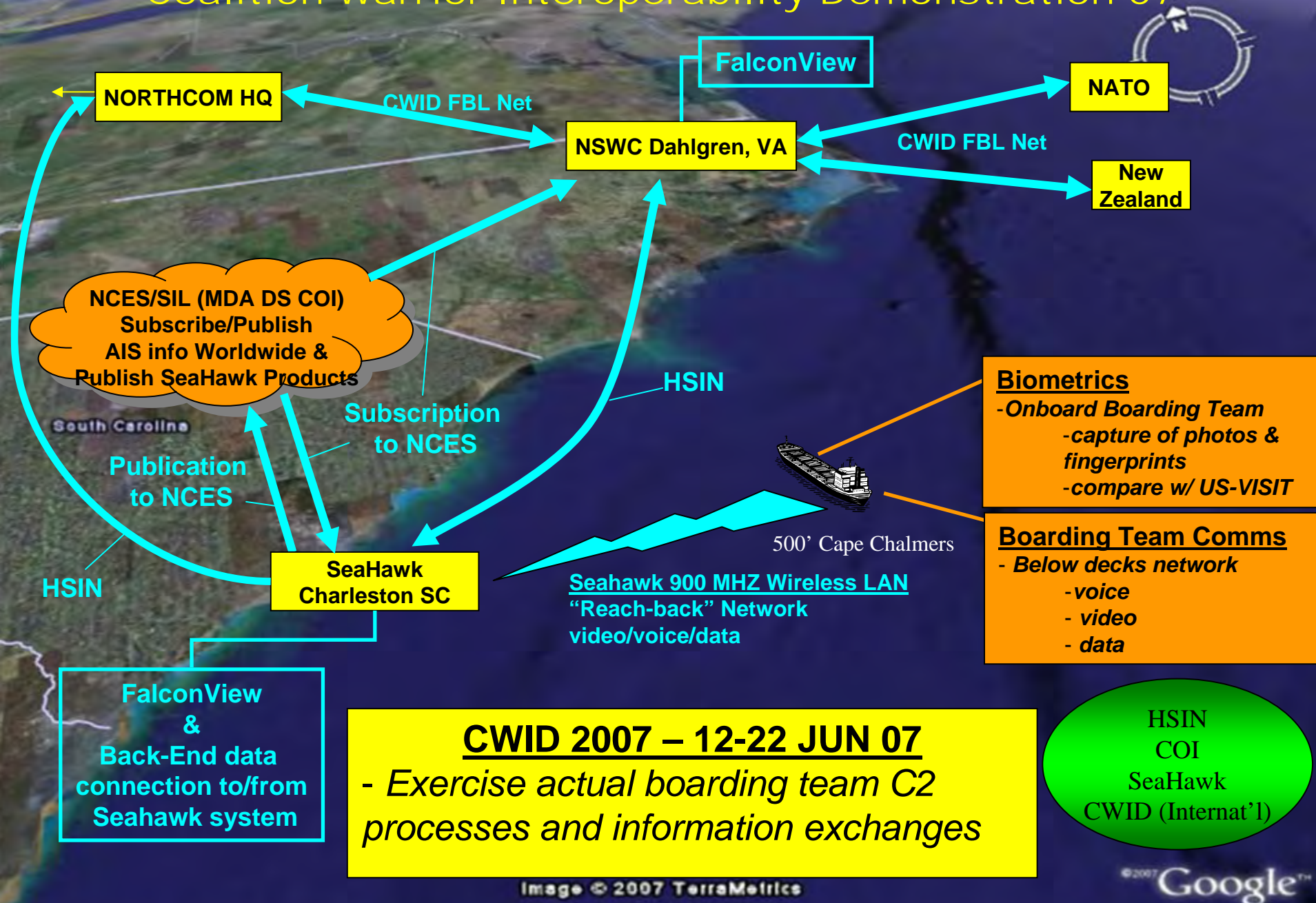


# MSSIS – Volpe



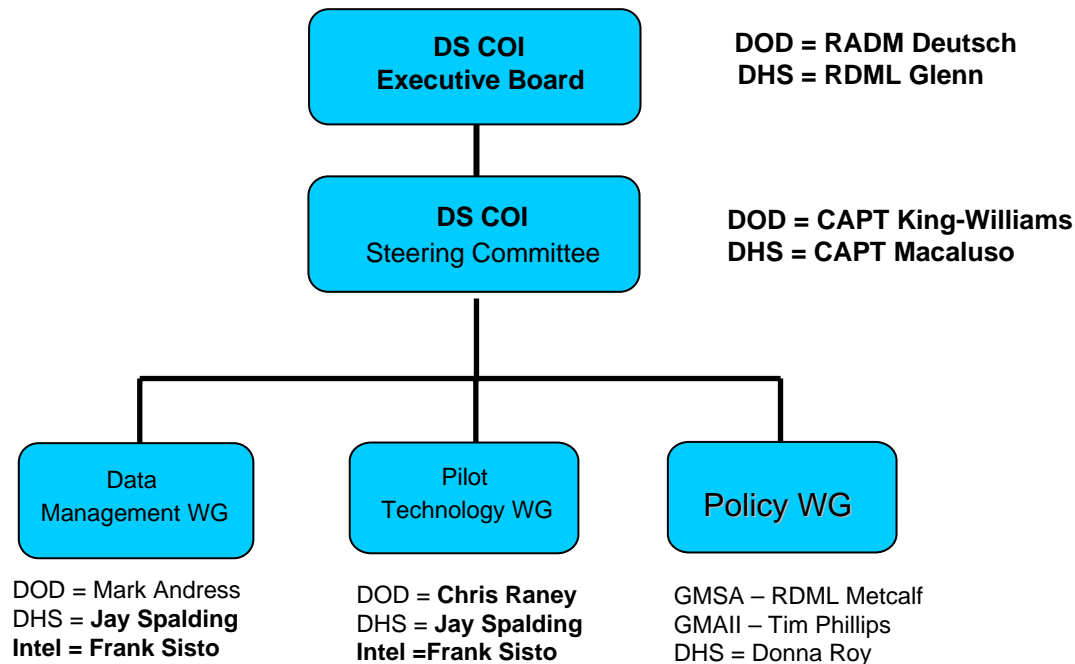


# Coalition Warrior Interoperability Demonstration 07



# Spiral 2 & 3 Governance

## Spirals 2&3





# Spiral 3 Recommendation

---

Advance Notice of Arrival (ANOA) – CG-26

Single Integrated Look Out List (SILO) – ONI

ANOA – Sensitive Data Challenge – Develop Policy and Attribute-Based Access Control (ABAC) to enable Need-to-Share

SILO – Policy Challenge – Aggregation of Lists; Security Challenges (GENSER, SIPRNet)

Broadens & Augments Scope of Data Sharing; Beyond AIS

Catalyst Events – Trigger Higher-Level Data Services

Complement Efforts of Other Organizations (CBP, ICE)



# Spiral 3 Recommendation

**At Spiral 3 Kick-Off meeting, DS COI recommended Advanced Notice of Arrival (ANOA) and Single Integrated LookOut (SILO) List be made Net-Centric on NCES.**

## ANOA

**Federal Regulation that ALL Vessels inbound or departing from the U.S. file a Notice of Arrival at least 96 Hours in advance**

**ANOA contains vessel, voyage, cargo, crew, passenger, equipment condition, etc.**

**Collected by USCG; currently shared with intel and operations centers through manual web interaction, fax, and point-to-point data connections.**

## SILO

**“Maintain in coordination with cognizant authorities and centers, a single, integrated lookout (SILO) list of all vessels of domestics and global interest.”**

**- *GMII Plan***



# Attribute-Based Access Control

**With Leverage of ABAC, Spiral 3 will continue to expose data sources and allow the DS COI to:**

- **Move beyond unrestricted sharing and ensure secure sharing of ANOA and SILO data to:**
  - **Law Enforcement**
  - **DHS (beyond USCG)**
  - **Coalition Partners**
- **Ensure greater level of control of data in accordance with information sharing laws, policies, and agreements.**
- **Federated: Publishers maintain attribute store for published data.**
- **Provide risk reduction for future PORs by proving out ABAC as an early user within NCES**

**The DS COI is monitoring the CMA JCTD development of a Maritime Information Exchange Model. Our intent is to adopt best practices from the MIEM in the DS COI information exchange schema.**





# Risk Reduction/Mitigation

---

## **Leveraging and Investigating Emerging SOA Infrastructures**

- DISA NCES
- DHS HSIN

## **Interagency data sharing and interoperability (need to share)**

## **DoD Exercise Environments for MUA**

- Coalition Warrior Interoperability Demonstration (CWID) – Joint
- Trident Warrior – Navy
- SeaHawk – Law Enforcement (Depts of Justice & Homeland Sec'y)

## **C&A in a Net-centric environment**

## **Security and Access Policy (federal, non-federal, coalition)**

## **Global Maritime Situational Awareness**



# Conclusion

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**Jay Spalding, U.S. Coast Guard**

**MDA DS COI Technical Lead**

[Jay.W.Spalding@uscg.mil](mailto:Jay.W.Spalding@uscg.mil)

**CAPT John J. Macaluso, U. S. Coast Guard**

**MDA DS COI Steering Committee**

[john.j.macaluso@uscg.mil](mailto:john.j.macaluso@uscg.mil)





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# ***Innovation that Works***

Turning Ideas Into  
Opportunities – The Movement  
To Open Innovation

F.I.R.S.T (Forum for Innovation  
Research & Teaching) -- GSBPP at NPS

Monterey, California

[WWW.NPS.EDU](http://WWW.NPS.EDU)





# Objectives

- **Focus on organizational side of innovation**
- **Stimulate a deeper understanding of a still emerging field**
- **Share ideas, insights, knowledge with each other and the audience**
- **Connect & network with other interested parties**
- **Compare/contrast innovation initiatives within and outside the military**



# Sponsorship

- **USCG**
- **GSBPP at the Naval Postgraduate School**
- **FIRST (Forum for Innovation Research, Service and Teaching)**



# Forum for Innovation Research, Strategy, & Teaching



FIRST: *outwitting, outmaneuvering  
and outperforming our  
enemies*

FIRST: *responding to global  
disasters*

FIRST: *leading innovation within  
the military*

Sponsored by the:  
Graduate School of Business &  
Public Policy (GSBPP)  
Office of Naval Research (ONR)  
Executive Learning Officer (ELO)





# Panel Members

- **Marc Ventresca - Professor, NPS**
- **Roxanne Zolin - Professor, NPS**
- **Paul Reed – IBM**
- **LCDR Gary. M. Thomas – USCG**
- **Neal Thornberry – Innovation Chair,  
GSBPP/CEE and Professor, Babson College**



# Format

- Session 1 – Brief introductions followed by a moderated panel format
- Session 2 – Breakout tracks by area for a deeper dive



- **Greg Kelleher (IBM) Differentiating Ideas from Opportunities – *Track-1, Rm. 238***
- **Marc Ventresca and Roxanne Zolin (NPS) Creating a Culture of Innovation – *Track-2, Rm. 239***
- **Gary Thomas (USCG) The Innovators Within – *Track-3, Rm. 344***
- **Neal Thornberry (NPS/Babson) Sustaining Innovation – Building Opportunity Engines – *Track-4 Rm. 346/347***



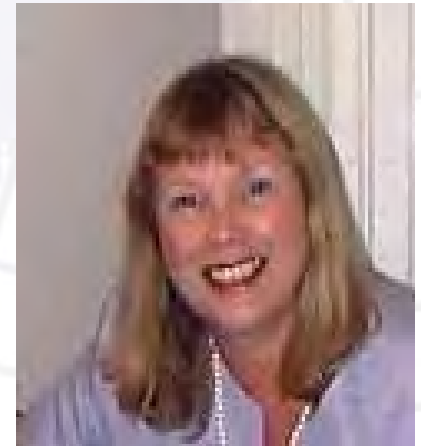


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# Introductory Remarks

# Creating a culture of innovation

- **Marc Ventresca**
  - **Strategy and innovation; services and knowledge-intensive industries; market creation and organizational innovation; (Ph.D. Stanford; faculty at Kellogg/ Northwestern, Oxford, now at NPS)**
- **Roxanne Zolin**
  - **Entrepreneurship and innovation; ‘swift’ trust in hastily-formed networks, 15 years experience as entrepreneur; (Ph.D., Stanford School of Engineering; faculty at NPS and Queensland Technology University)**



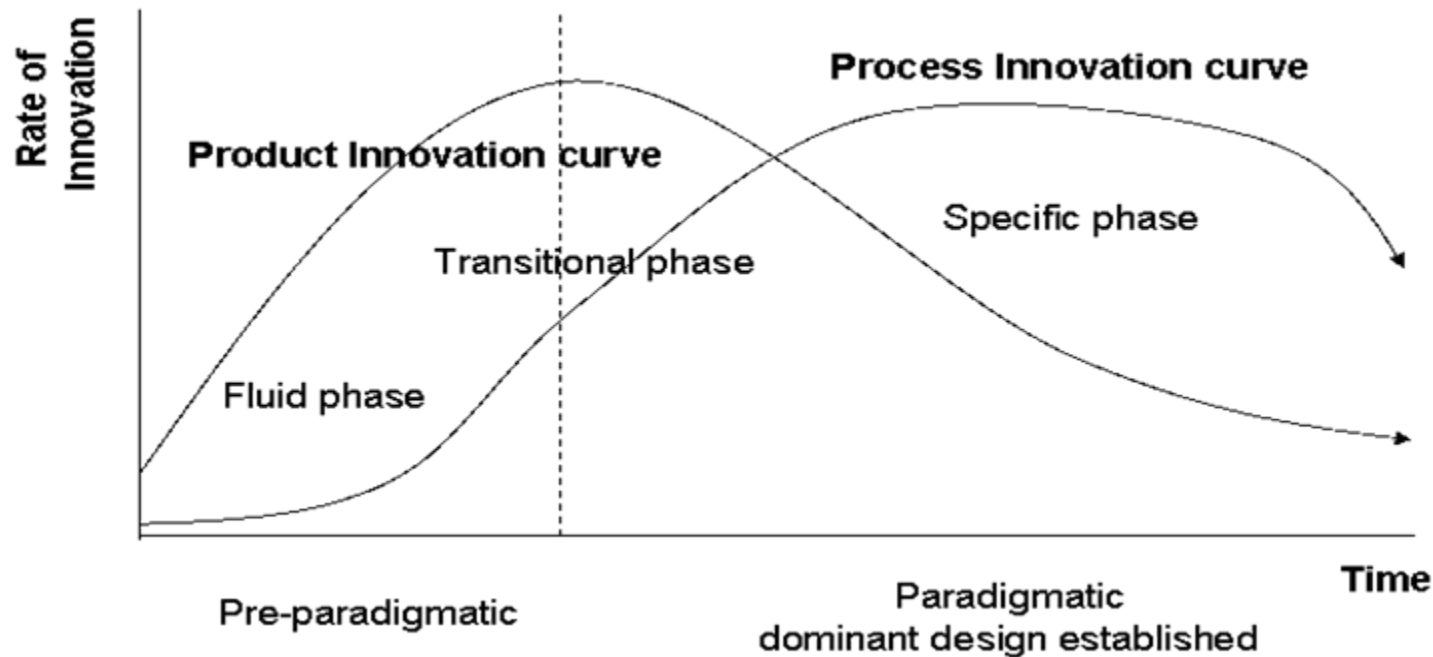
# Creating a culture of innovation

- **What is the organizational basis for innovation strategies in Google, Eli Lilly, and other firms and agencies?**



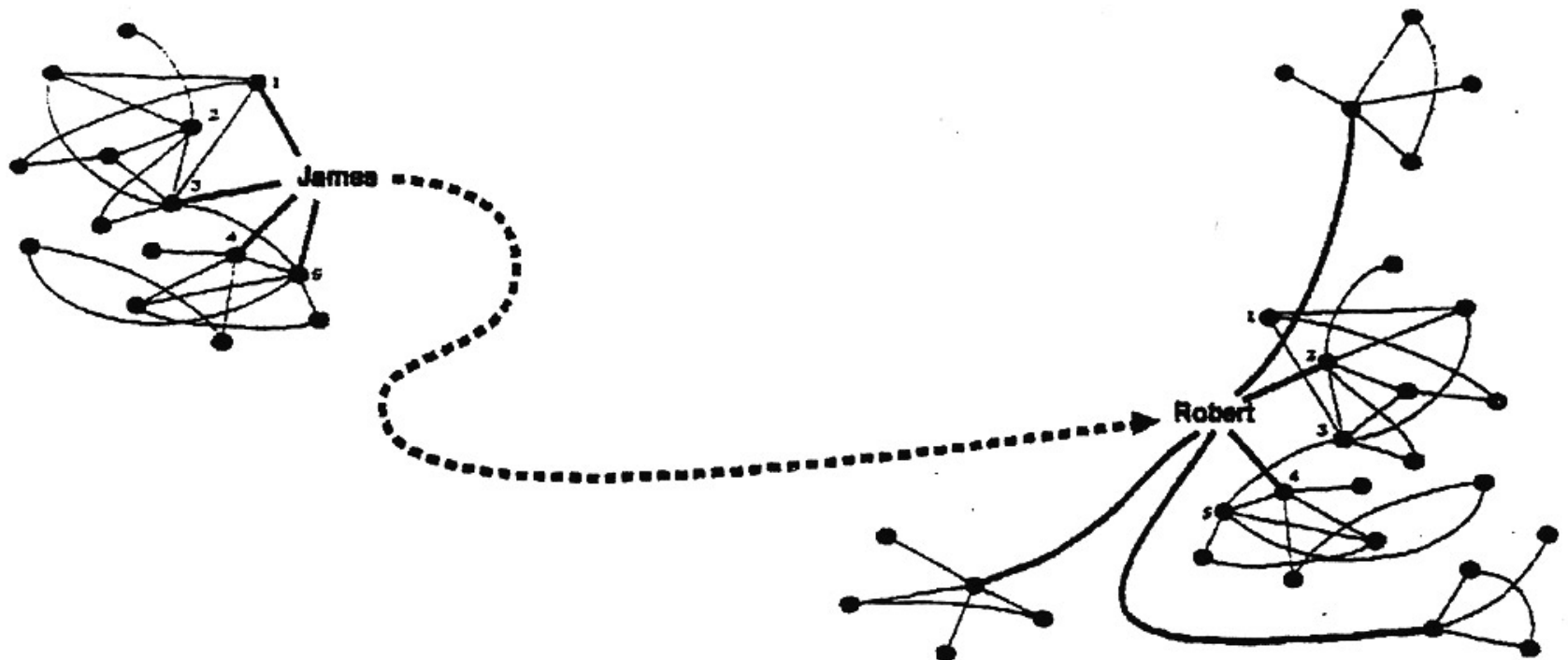


## What cultural and institutional factors drive innovation over time?



# Creating a culture of innovation

- How to develop an innovation network?
- How to support innovation across the firm or agency?





# Lead Like an Entrepreneur

*Tactics to expand your leadership capabilities by applying entrepreneurial skills in your organization*







# Entrepreneurship: The Other Side of Innovation

- “Entrepreneurship always involves innovation, but innovation does not always involve entrepreneurship”
- 15 years working with large organizations trying to rekindle/sustain both
- Identification & articulation of underlying principals
- The creation of Value

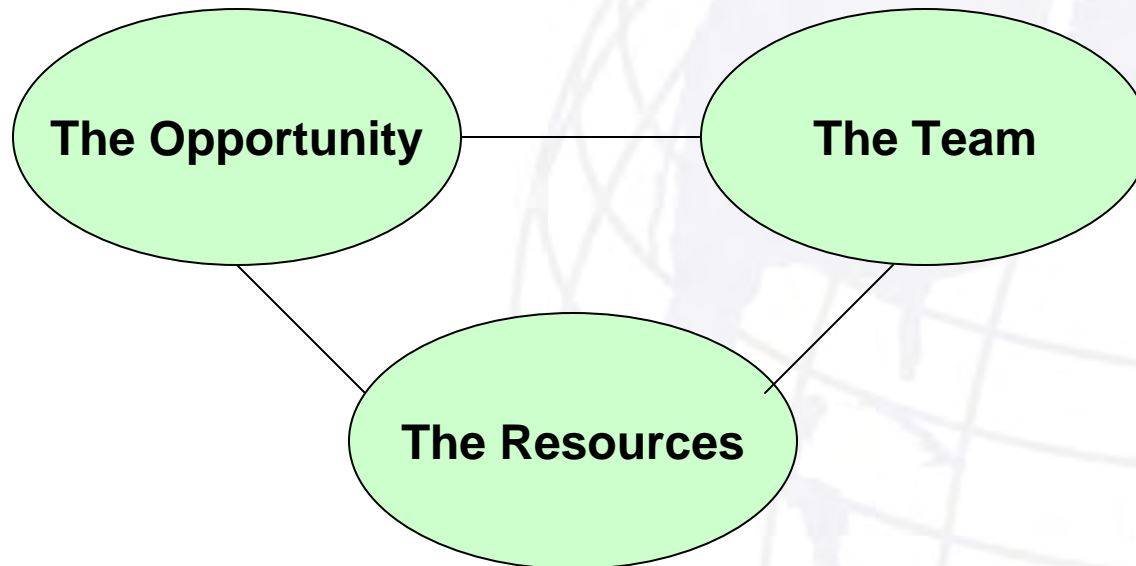


# The Entrepreneurial Process

Ideas



## The Balancing Act





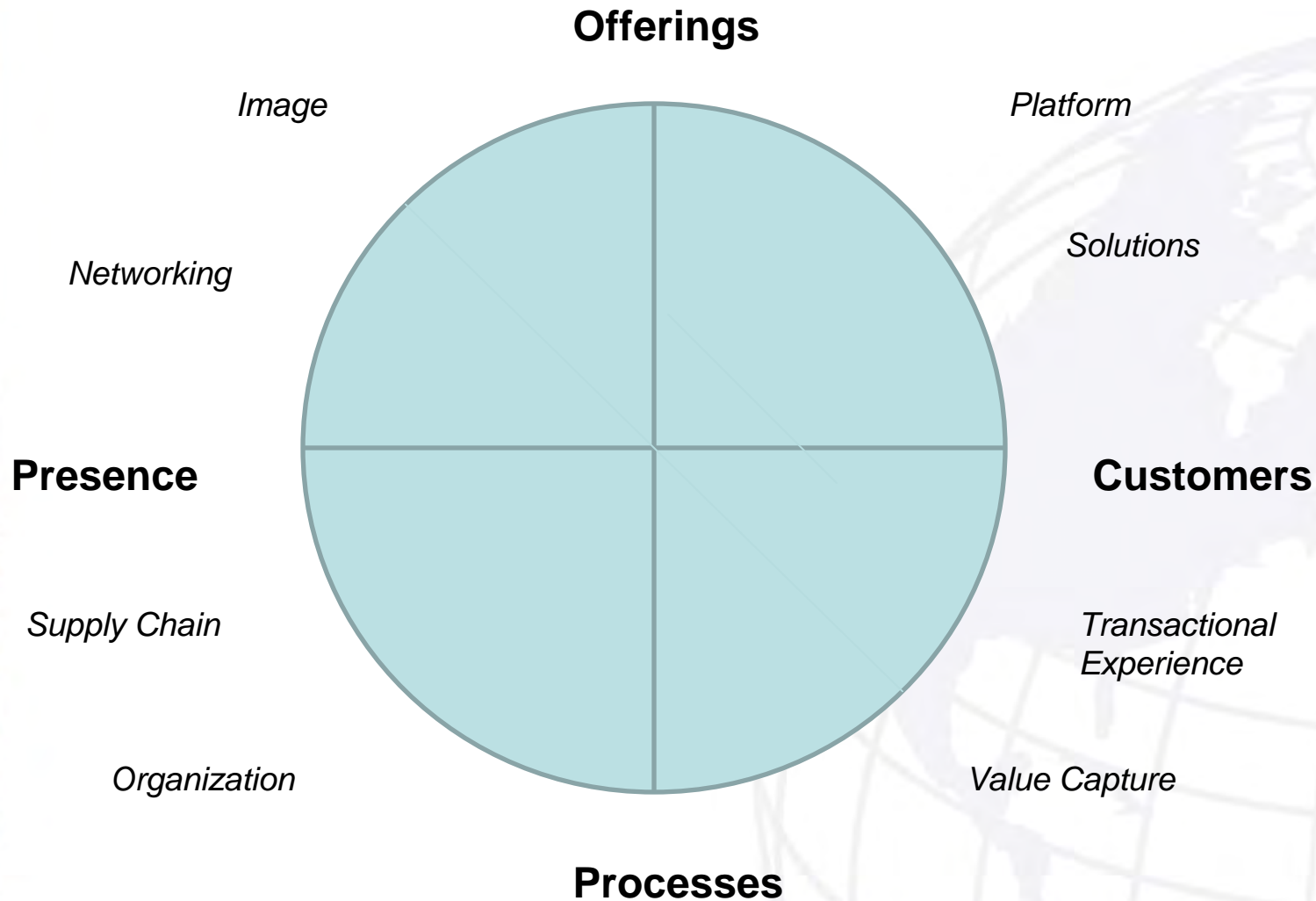
# Focusing Entrepreneurial Energy

	Internal	External
Activist	<b><i>“Miners”</i></b> (Value Chain)	<b><i>“Explorers”</i></b> (Market)
Catalyst	<b><i>“Accelerators”</i></b> (Unit)	<b><i>“Integrators”</i></b> (Enterprise)





# What kind of Innovation?

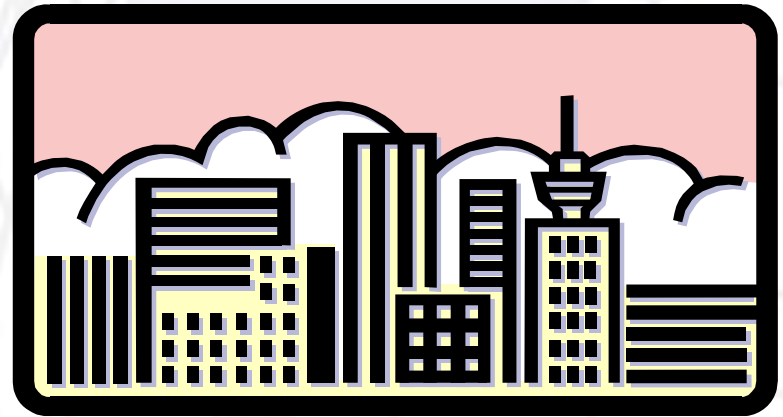
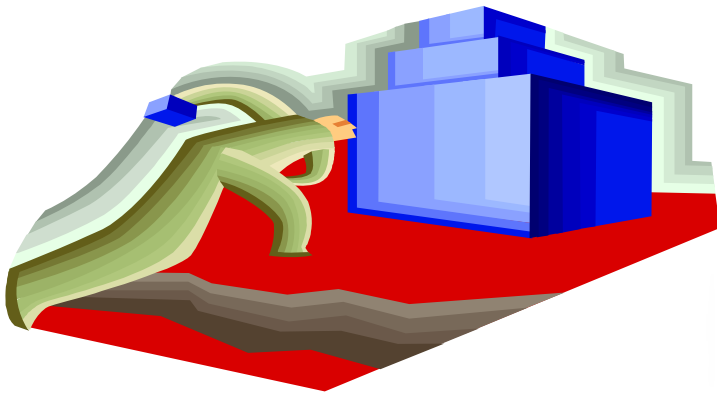


# Place your Bets!

Entrepreneurial Leaders?

Entrepreneurial Engines (structures/processes)?

A combination?





# Opportunity Engines

- IDG
- Siemens
- P&G
- Intel
- IBM





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[WWW.NPS.EDU](http://WWW.NPS.EDU)

# BusinessWeek

APRIL 24, 2005 [www.businessweek.com](http://www.businessweek.com)

## THE WORLD'S MOST INNOVATIVE COMPANIES



Start with Sony



WHO

APPLE  
P&G  
SAMSUNG  
IBM  
BMW  
STARBUCKS  
TOYOTA  
GOOGLE

HOW

Innovator in chief  
Share patents  
Networks of brainy scientists  
Design strategy  
Speed cycle time  
Get into the customer's head  
Free time to experiment  
Embrace suppliers



be courageous  
take big risks!



is there an innovation premium  
in stock price? at year!!



- Average life expectancy of all firms, regardless of size, measured in Japan and much of Europe, is only 12.5 years.
- The average life span of a multinational organization - Fortune 500 or equivalent - is around 45 years.
- One third of the companies listed in the Fortune 500 in 1970 for example, had disappeared by 1983 - acquired, merged or broken to pieces.
- The first S&P index of 90 major US firms was created in the 1920s. The firms on that original list stayed there for an average of 65 years. By 1998, the average tenure of a firm on the expanded S&P 500 was 10 years.

Source: The Living Company, Arie de Geus





- 80% of venture capital funded start-ups fail within the 1<sup>st</sup> 2 years
- 90% of all firms are unable to sustain an above-average growth rate for more than a few years
- 75% of new products launched by established firms fail
- In 2006 Hyundai beat Toyota in JD Power's Quality Survey
- 2007 Forrester Report questions ROI of government sponsored innovation research as creating no sustainable value

Source: Christensen, 2004



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# In Search of the Dragon

[WWW.NPS.EDU](http://WWW.NPS.EDU)





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## *Dragon Building*

Innovation & Corporate Entrepreneurship  
in Large Companies

Monterey, California

[WWW.NPS.EDU](http://WWW.NPS.EDU)



# The Best of Both Worlds

- Strategic planning
- Organizational structure
- Control of employee behaviors
- Strong/Powerful
- Opportunity focus
- Opportunity structure
- Release of employee creativity
- Agile

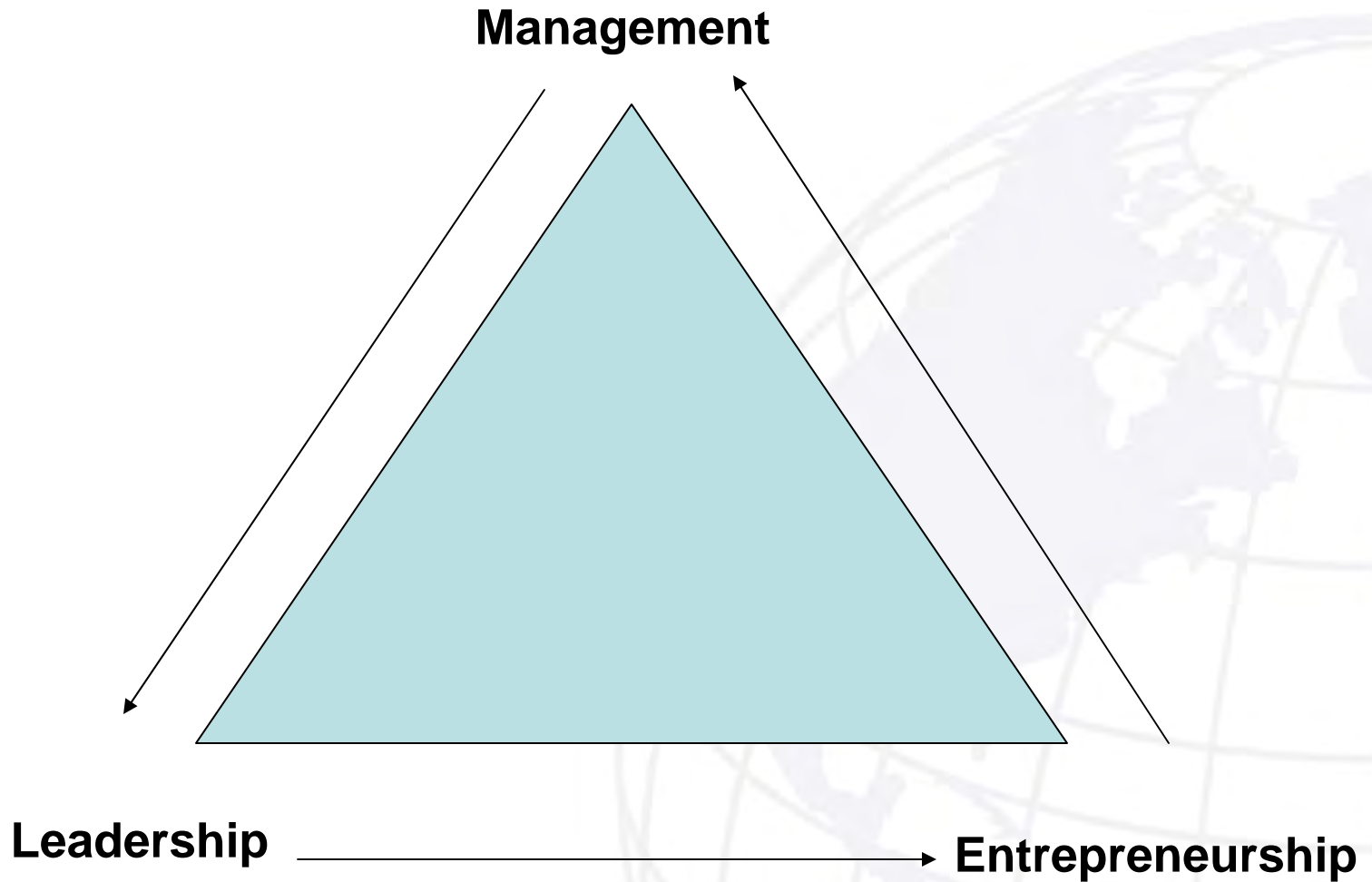


# Dragon Serum

- Siemens
- Mott's (Cadbury Schweppes)
- France Telecom
- Sodexho
- DaimlerChrysler



# A New View





# Focusing Entrepreneurial Energy

	Internal	External
Activist	<b><i>“Miners”</i></b> (Value Chain)	<b><i>“Explorers”</i></b> (Market)
Catalyst	<b><i>“Accelerators”</i></b> (Unit)	<b><i>“Integrators”</i></b> (Enterprise)



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# Dragon Dens

Structuring Innovation & Entrepreneurship  
In Large Companies

Monterey, California

[WWW.NPS.EDU](http://WWW.NPS.EDU)





- Systematize Innovation and entrepreneurial action
- Bolt on/Integrated
- Counterbalance current organization & culture
- Corporate Venturing Arms
- Innovation centers
- “VP of Strategy & Innovation”
- Open Sourcing



# A Definition of Entrepreneurial Leadership

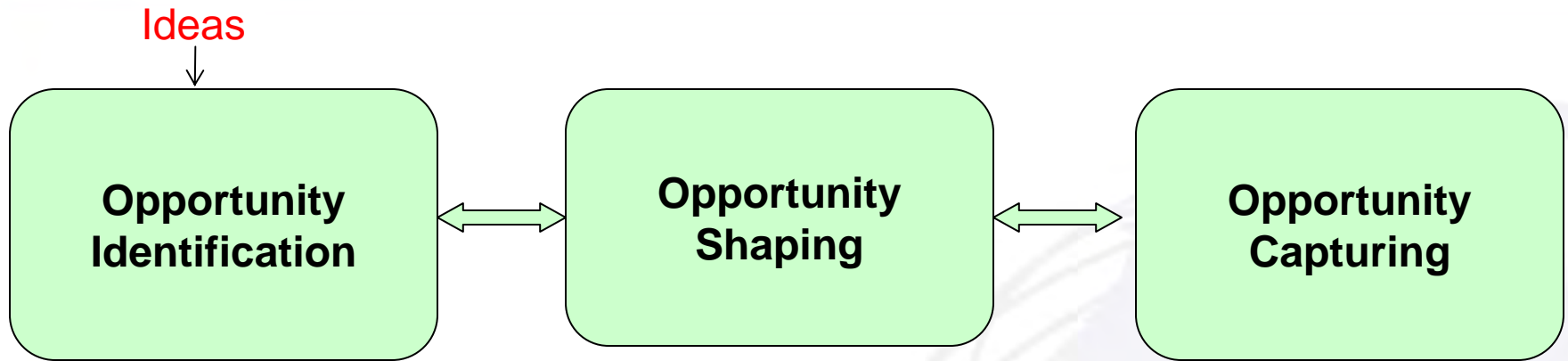
**The Identification, Development & Capturing of *Opportunities* within an existing organization requires:**

Innovative changes in the pattern of resource deployment for the:

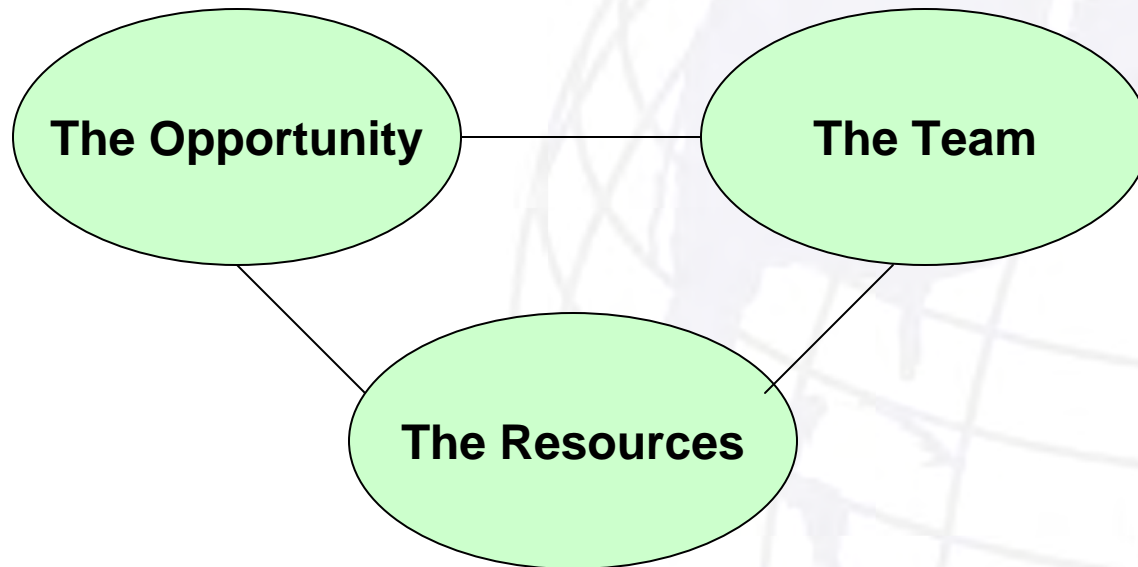
- Creation of new capabilities
- Resulting in new possibilities for significantly better performance and
- Enhanced long term value of the firm to its owners and employees



# The Entrepreneurial Process



## The Balancing Act







# Examples

- Intel
- Fortis
- Siemens
- IBM
- P&G



- Stealth Entrepreneur
- Hidden Innovation fund
- Discovery
- Seed Capital
- Incubator Model



- S3 General Managers Program
- Inject Entrepreneurial Serum
- 8 Months Entrepreneurship/Marketing/Finance
- BIPS (Business Improvement Projects)
- Measurable Results





- Enough Cost Cutting
- Focus on Innovation
- Analysis of Failures
- Development of Horizons Models
- Different Financial Requirements
- Different People
- Different Stages of Growth



# EBO Failure Analysis

1. IBM management systems focus too much on short term results, not strategic business building
2. Preoccupation with current markets & existing offerings
3. Business model focused on profits & earnings not value creation
4. Financial requirements not appropriate for embryonic markets
5. IBM lacks skills in new business development



# Horizons Model

- H 3 – Mature, well established businesses responsible for most of current profits
- H 2 - On the rise, rapid accelerating growth
- H 1 - Emerging, still developing, seeds of the companies future





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# P&G Corporation

## Corporate New Ventures



# Philosophy

- Forget the “Light bulb” phenomenon
- Best opportunities will come from leveraging our internal capabilities
- Structured approach to creativity
- Make it systematic and rigorous
- History will guide us: what worked, what didn’t & why
- Tremendous value in cross-organizational synergy



# Structure & Mission

- Report directly to senior management
- Cross-organizational membership
- Entrepreneurial track record
- Tour of duty that could result in faster promotion
- Mission: to play a direct role in the development of at least one major new business per year
- Leave a knowledge trail for further new business development





# CNV Environment

- All physically together
- Full-time job
- Open floor plan, no offices, “attic like”
- Couches, coffee machines, water coolers, trend magazines
- Away from the P&G coffee cart mentality
- Emphasis on maximizing each individual’s creativity
- Off-site laboratory, support staff, MBA interns



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# CNV Processes



# Idea Generation

Thorough understanding of P&G capabilities

- Understanding of consumer needs, especially non-articulated needs
- Analysis over brainstorming
- Vision of P&G as a gold mine
- CNV to sift through tons of information in search of a few nuggets
- Designed and enhanced internet search engine through USC supercomputer





# Idea Generation cont.

- Box lunches with external thought leaders
- Targeted convention and trade-show attendance
- Team members selected ideas for which they had some passion and personal interest
- Examined the function of technology, not its specific brand application
- Examined trends and look for intersections



# Idea Evaluation

- “The key to innovation is not picking the winners, but weeding out the losers” (Craig Wynett CNV Manager)
- 3 Basic Questions:
  1. Is there a basic consumer need?
  2. Does P&G have a technology(s) that can satisfy this need?
  3. Can we create a profitable business model than can capture this opportunity?
- Analysis of successful/failed new product development activities



# CNV Challenges

- Handed off 5 new projects the first year
- Sector responsibility for capturing opportunities which they did not create
- Conflict regarding who should lead the search for new products
- Stretched resources due to requests for help
- CNV could become the bureaucracy it hoped to outwit
- Internal enemies





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# P&G Now

[WWW.NPS.EDU](http://WWW.NPS.EDU)



# P&G Transition

- CNV to Global BD to Licensing & CNV
- P&G still invests \$2Billion per year in research but has Corporate Innovation Fund cut in half
- “Spaghetti against the Wall”
- Laffley: “More discipline”
- GBD: Swiffer, Thermacare, Olay
- Open to sell any one of its 27,000 patents
- Money given directly back to business unit who created it for future investments



# P & G: Connect & Develop

- 360 Degree Innovation - Internal
- Connect internally & externally
- Crest White Strips – R&D new film, bleach, fabric, oral care
- Olay daily facials – detergents, bounce, tissues & towels
- Intranet “Ask me”
- 21 R&D communities of practice
- Global cross business unit technology council

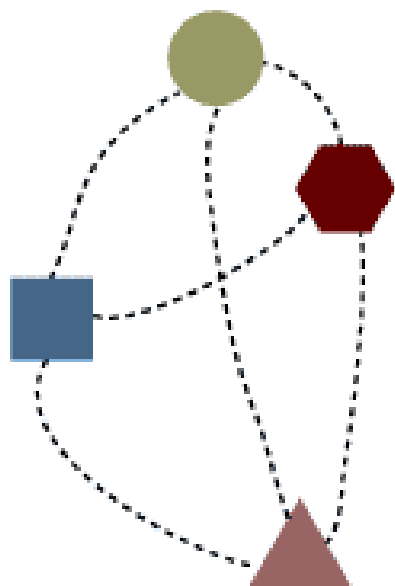




- 360 degree external
- 55 cross business unit “technology entrepreneurs”
- Search for ideas & solutions
- Heavy internet use
- 2002 (20%), 2005 (35%) target (50%)
- 20% decrease in internal R&D investment


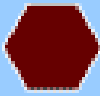
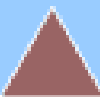

# A new model of Innovation

## Innovation Network



## Business model

## Specialization

 Inventor	<p>Intellectual powerhouses that conduct basic science research and/or design products and services that result in patentable inventions.</p> <p><b>Example:</b> MIT, IDEO, SRI, GE Global Research, KAIST, Celera, Oxford, Microsoft Research, HP Labs, CNRS, Persistent, IIT</p>
 Transformer	<p>Multifunction production and marketing services that convert inputs from Inventors and other Transformers into valuable business innovations for either internal or external customers.</p> <p><b>Example:</b> Dell, Pfizer, BP, Merrill Lynch, SAIC, IBM, Infosys</p>
 Financier	<p>Funding source for Innovation Network service providers — especially Inventors and startup Transformers. Financiers will seek to own intellectual property rights for inventions.</p> <p><b>Example:</b> Cargill Ventures, Silicon Valley Bank, Garnett &amp; Helfrich Capital, InterActiveCorp, ICICI Bank, Vulcan, IP2IPO</p>
 Broker	<p>Market makers that find and connect Innovation Network service providers — buying and selling or enabling service delivery both within and among companies.</p> <p><b>Example:</b> Knowledge Campus, yet2.com, PLX Systems, Big Idea Group, InnoCentive, Evaluateserve, ISTC, Intellectual Ventures, P&amp;G's Technology Entrepreneurs, DCMA, METI, TIE</p>

Source: Forrester Research, Inc.

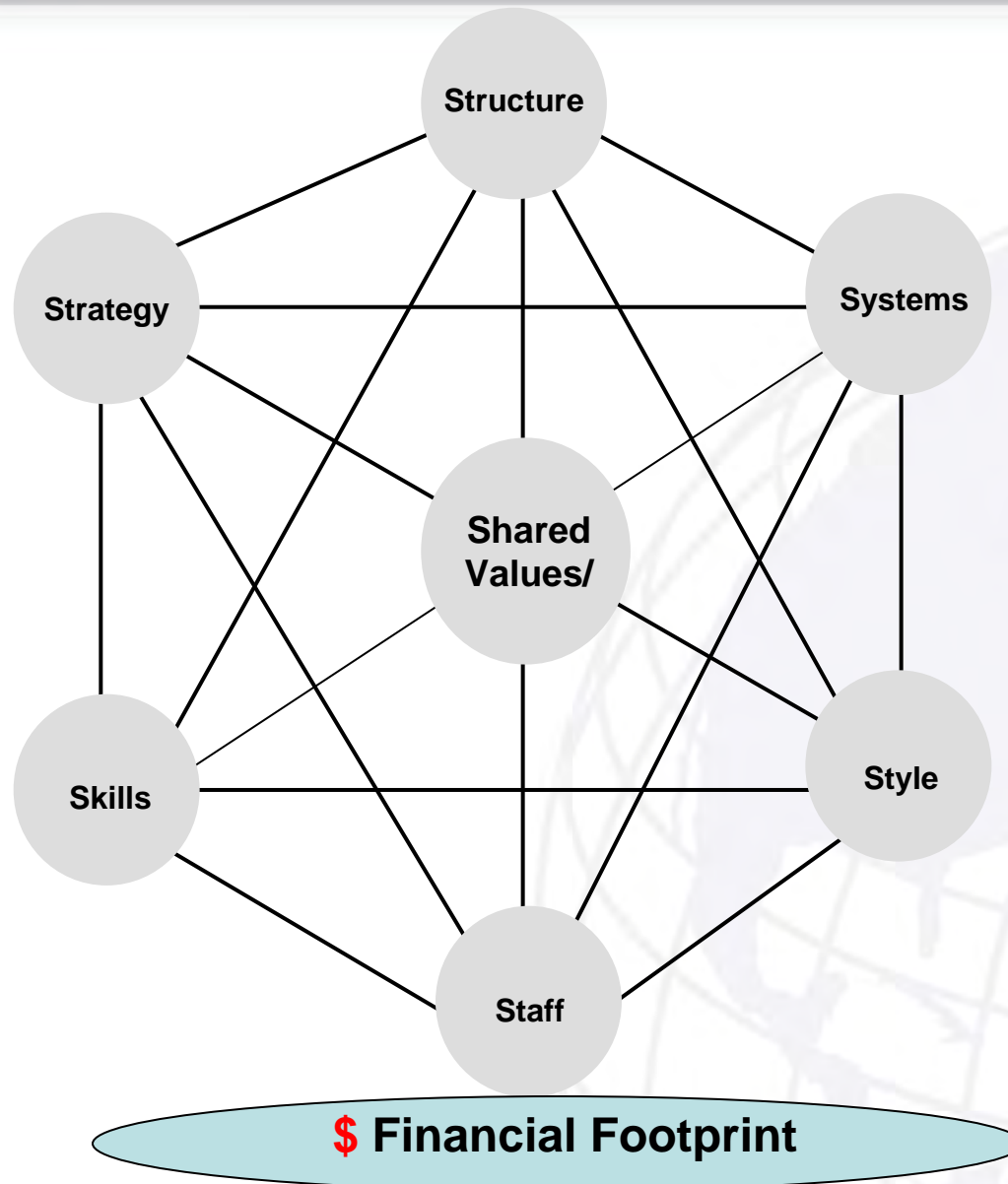


- Grafting VC models not appropriate
- Internal stakeholders must be involved from the outset
- Ecosystem focus
- Innovation from anywhere
- Networking paradigm
- Designated structures/designated roles
- Commercialization of innovation





# The 7-S + 1 Framework





“Emotionally committed employees form teams that deliver exceptional outcomes.”

~ Curt W. Coffman and Gabriel Gonzalez-Molina  
*Follow This Path:How the World's Greatest Organizations Drive Growth by  
Unleashing Human Potential*



WHY =  
23%


Langer was right





Manifesto: 29 to 67 with 35

Manager to Reporter



*“People want to be part of something larger than themselves. They want to be part of something they’re really proud of, that they’ll fight for, sacrifice for, trust.”*

—Howard Schultz, Starbucks



UNITED STATES GOVERNMENT ACCOUNTABILITY OFFICE

# 21st Century Transformation Challenges and Opportunities

**The Honorable David M. Walker**  
**Comptroller General of the United States**

**The Coast Guard Innovation Expo**  
**New Orleans, LA**  
**October 30, 2007**



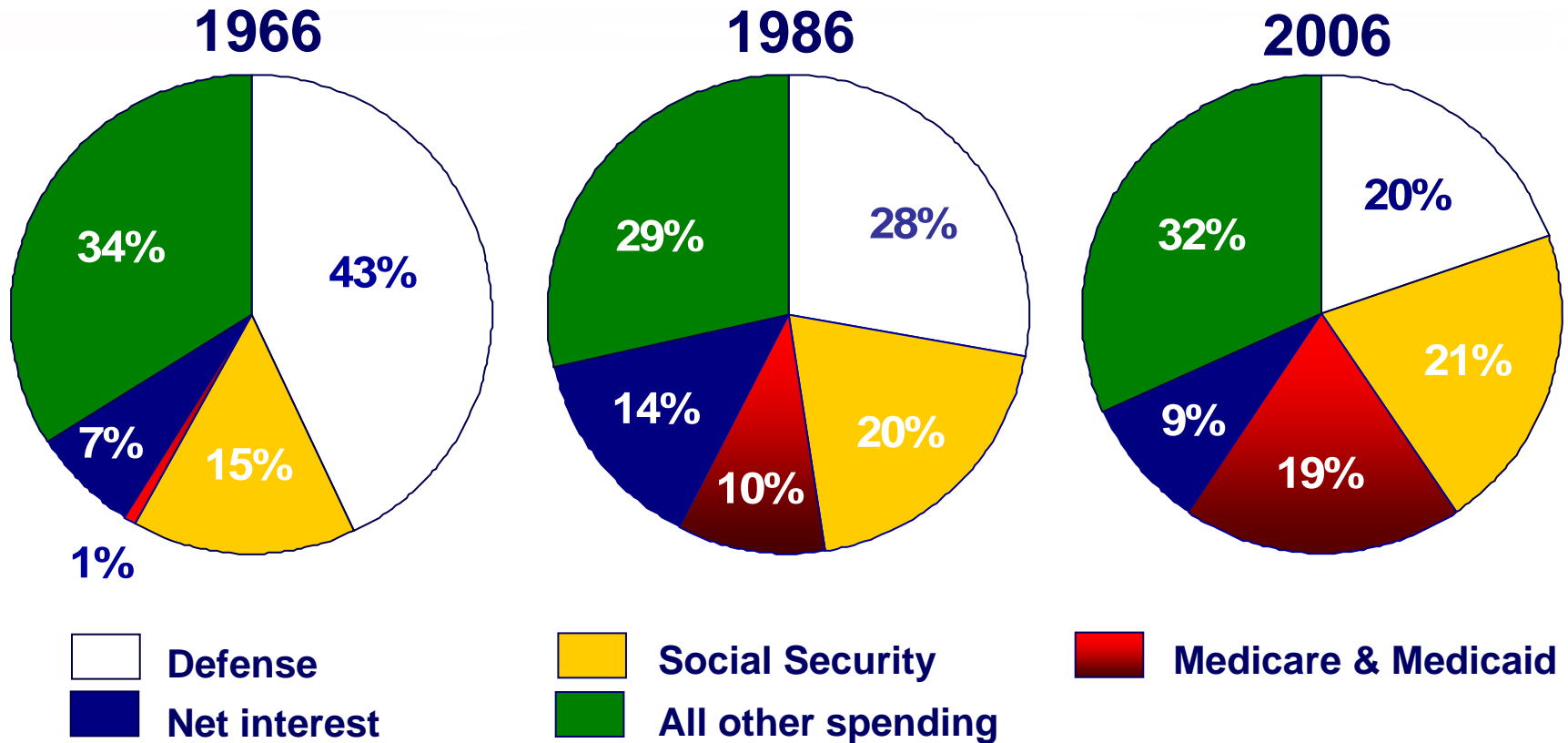


# The Case for Change

**The federal government is on a “burning platform,” and the status quo way of doing business is unacceptable for a variety of reasons, including:**

- Past fiscal trends and significant long-range challenges
- Selected trends and challenges having no boundaries
- Additional resource demands due to Iraq, Afghanistan, incremental homeland security needs, and recent natural disasters in the United States
- Numerous government performance/accountability and high risk challenges
- Outdated federal organizational structures, policies, and practices
- Rising public expectations for demonstrable results and enhanced responsiveness

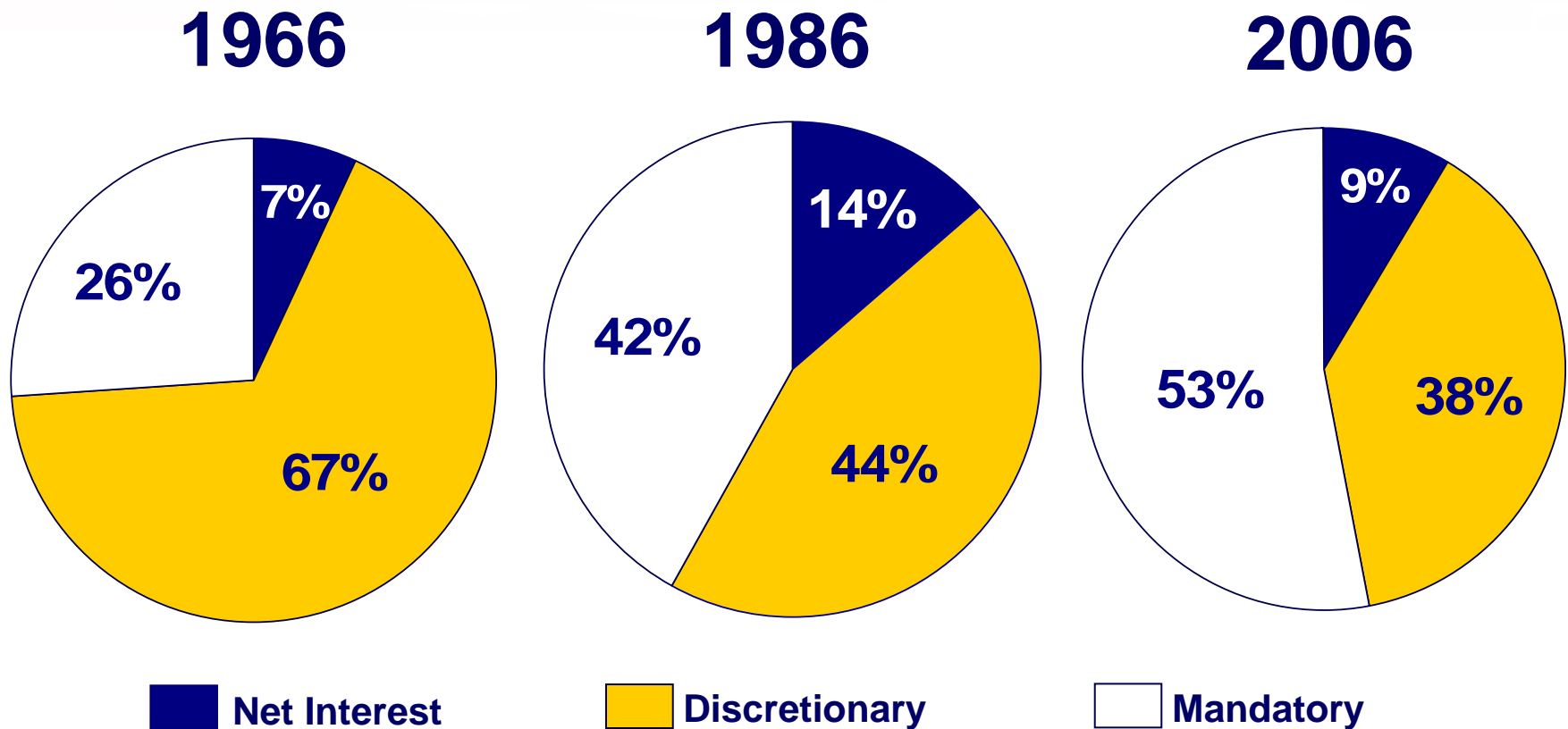
# Composition of Federal Spending



Source: Office of Management and Budget and the Department of the Treasury.

Note: Numbers may not add to 100 percent due to rounding.

# Federal Spending for Mandatory and Discretionary Programs



Source: Office of Management and Budget.



# Fiscal Year 2005 and 2006 Deficits and Net Operating Costs

	Fiscal Year 2005	Fiscal Year 2006
	(\$ Billion)	
<b>On-Budget Deficit</b>	<b>(494)</b>	<b>(434)</b>
<b>Unified Deficit<sup>a</sup></b>	<b>(318)</b>	<b>(248)</b>
<b>Net Operating Cost<sup>b</sup></b>	<b>(760)</b>	<b>(450)</b>

Sources: Office of Management and Budget and Department of the Treasury.

<sup>a</sup>Includes \$173 billion in Social Security surpluses for fiscal year 2005 and \$185 billion for fiscal year 2006; \$2 billion in Postal Service surpluses for fiscal year 2005 and \$1 billion for fiscal year 2006.

<sup>b</sup>Fiscal year 2005 and 2006 net operating cost figures reflect significant but opposite changes in certain actuarial costs. For example, changes in interest rates and other assumptions used to estimate future veterans' compensation benefits increased net operating cost by \$228 billion in 2005 and reduced net operating cost by \$167 billion in 2006. Therefore, the net operating costs for fiscal years 2005 and 2006, exclusive of the effect of these actuarial cost fluctuations, were (\$532) billion and (\$617) billion, respectively.

# Major Fiscal Exposures

(\$ trillions)

	2000	2006	% Increase
• <b>Explicit liabilities</b>	\$6.9	\$10.4	52
<ul style="list-style-type: none"> <li>• Publicly held debt</li> <li>• Military &amp; civilian pensions &amp; retiree health</li> <li>• Other</li> </ul>			
• <b>Commitments &amp; contingencies</b>	0.5	1.3	140
<ul style="list-style-type: none"> <li>• E.g., PBGC, undelivered orders</li> </ul>			
• <b>Implicit exposures</b>	13.0	38.8	197
<ul style="list-style-type: none"> <li>• Future Social Security benefits</li> </ul>	3.8	6.4	
<ul style="list-style-type: none"> <li>• Future Medicare Part A benefits</li> </ul>	2.7	11.3	
<ul style="list-style-type: none"> <li>• Future Medicare Part B benefits</li> </ul>	6.5	13.1	
<ul style="list-style-type: none"> <li>• Future Medicare Part D benefits</li> </ul>	--	7.9	
<b>Total</b>	<b>\$20.4</b>	<b>\$50.5</b>	<b>147</b>

Source: 2000 and 2006 Financial Report of the United States Government.

Note: Totals and percent increases may not add due to rounding. Estimates for Social Security and Medicare are at present value as of January 1 of each year and all other data are as of September 30.

# How Big is Our Growing Fiscal Burden?

This fiscal burden can be translated and compared as follows:

<b>Total –major fiscal exposures</b>	<b>\$50.5 trillion</b>
<b>Total household net worth<sup>1</sup></b>	<b>\$53.3 trillion</b>
<b>Burden/Net worth ratio</b>	<b>95 percent</b>
<b>Burden<sup>2</sup></b>	
<b>Per person</b>	<b>\$170,000</b>
<b>Per full-time worker</b>	<b>\$400,000</b>
<b>Per household</b>	<b>\$440,000</b>
<b>Income</b>	
<b>Median household income<sup>3</sup></b>	<b>\$46,326</b>
<b>Disposable personal income per capita<sup>4</sup></b>	<b>\$31,519</b>

Source: GAO analysis.

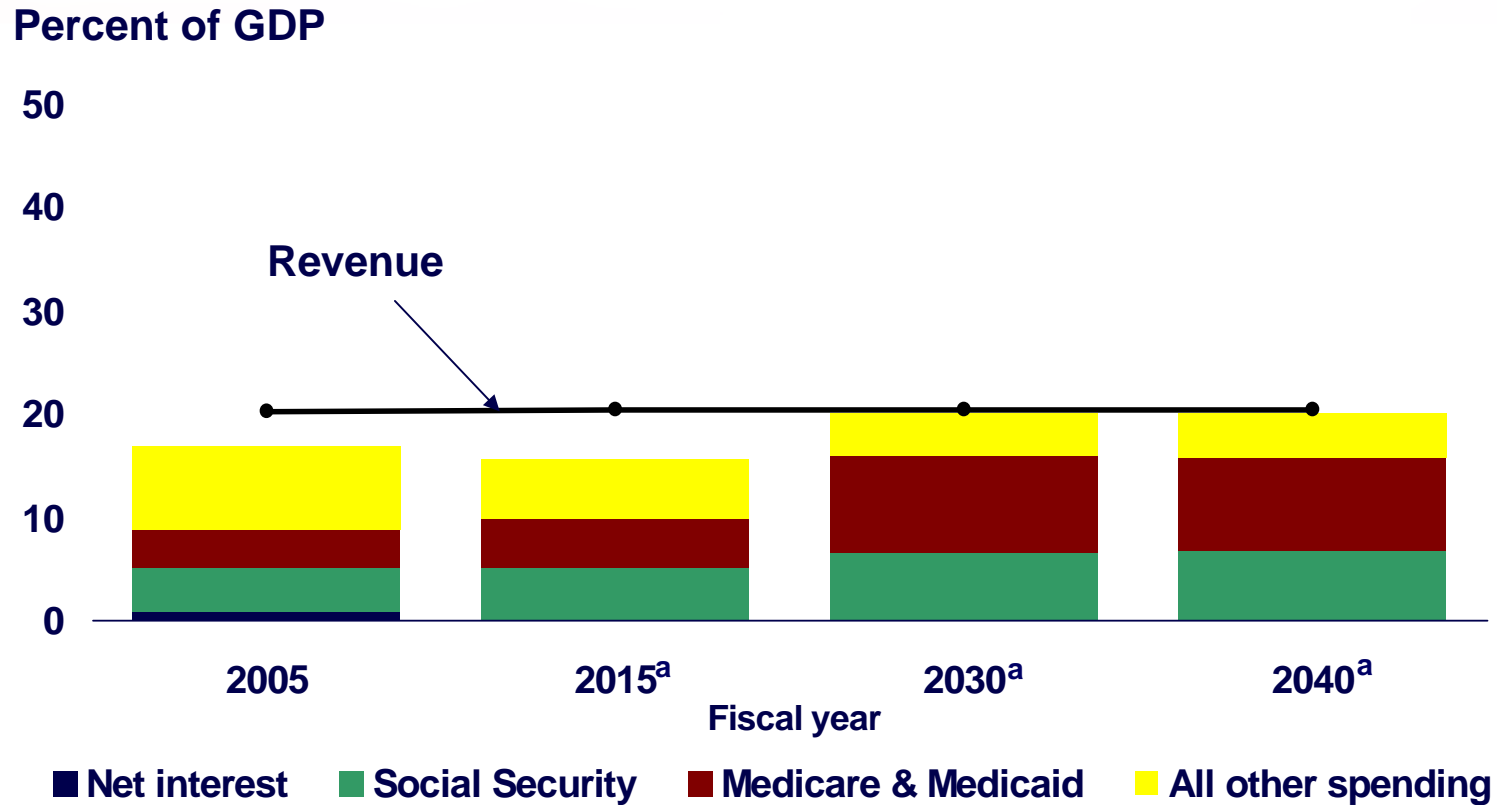
Notes: (1) Federal Reserve Board, Flow of Funds Accounts, Table B.100, 2006:Q2 (Sept. 19, 2006); (2) Burdens are calculated using estimated total U.S. population as of 9/30/06, from the U.S. Census Bureau; full-time workers reported by the Bureau of Economic Analysis, in NIPA table 6.5D (Aug. 2, 2006); and households reported by the U.S. Census Bureau, in Income, Poverty, and Health Insurance Coverage in the United States: 2005 (Aug. 2006); (3) U.S. Census Bureau, Income, Poverty, and Health Insurance Coverage in the United States: 2005 (Aug. 2006); and (4) Bureau of Economic Analysis, Personal Income and Outlays: October 2006, table 2, (Nov. 30, 2006).



# Potential Fiscal Outcomes

## Under Baseline Extended (January 2001)

### *Revenues and Composition of Spending as a Share of GDP*



Source: GAO's January 2001 analysis.

<sup>a</sup>All other spending is net of offsetting interest receipts.

# Potential Fiscal Outcomes

## Under Alternative Simulation

### *Revenues and Composition of Spending as a Share of GDP*

Percent of GDP

50

40

30

20

10

0

Revenue

2006

2015

2030

2040

Fiscal year

■ Net interest

■ Social Security

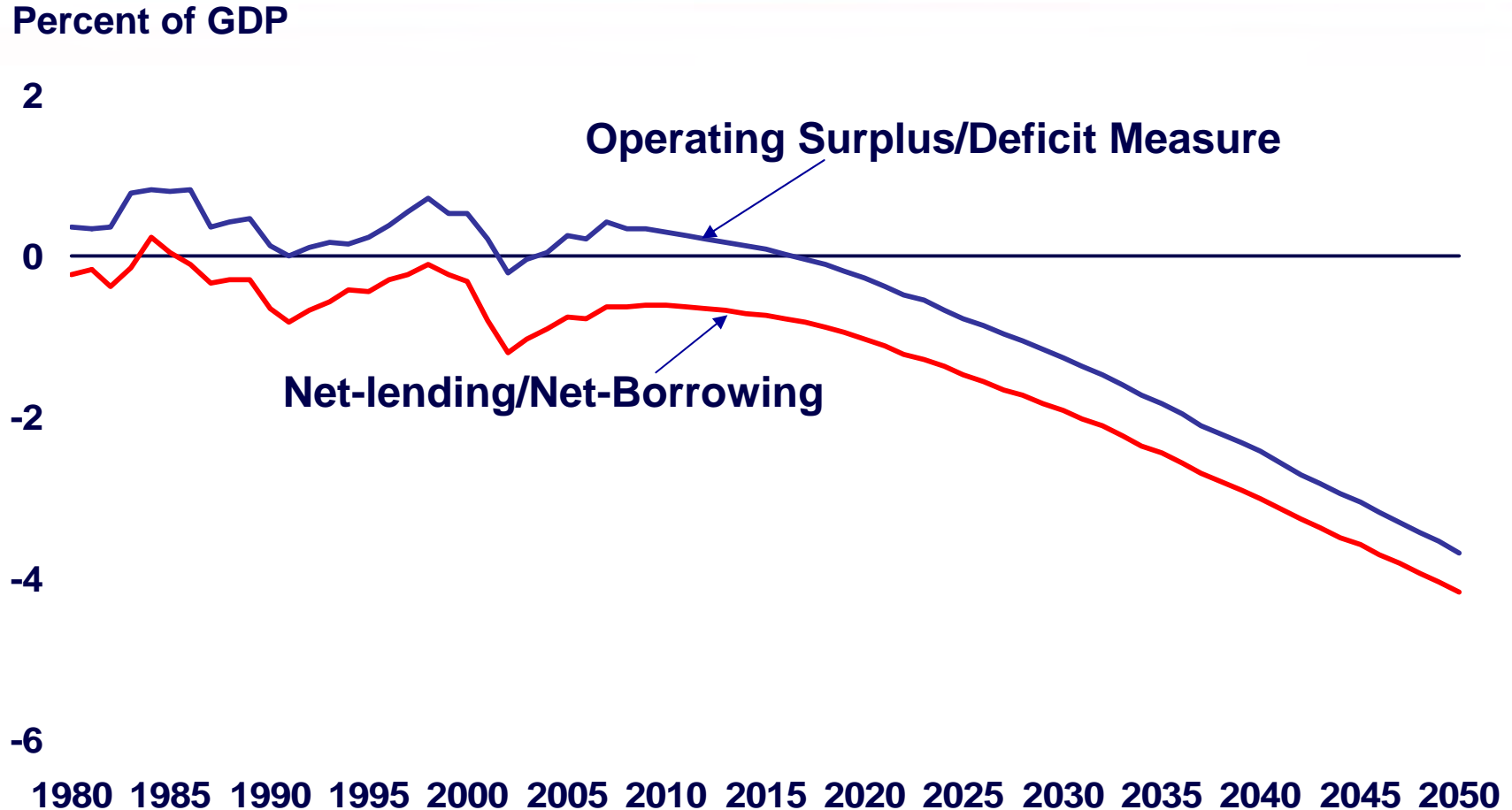
■ Medicare & Medicaid

■ All other spending

Source: GAO's August 2007 analysis.

Notes: AMT exemption amount is retained at the 2006 level through 2017 and expiring tax provisions are extended. After 2017, revenue as a share of GDP returns to its historical level of 18.3 percent of GDP plus expected revenues from deferred taxes, i.e. taxes on withdrawals from retirement accounts. Medicare spending is based on the Trustees April 2007 projections adjusted for the Centers for Medicare and Medicaid Services alternative assumption that physician payments are not reduced as specified under current law.

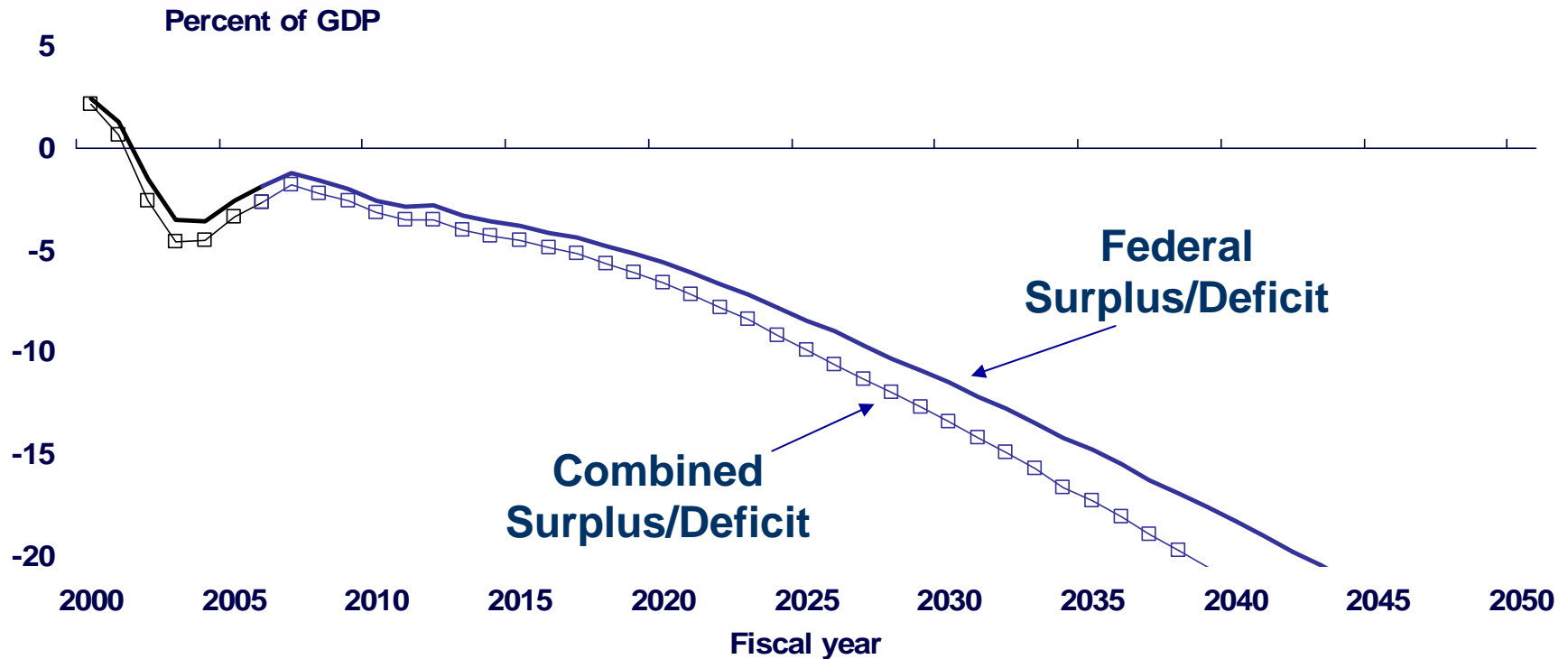
# State and Local Governments Face Increasing Fiscal Challenges



Sources: Historical data from National Income and Product Accounts. Historical data from 1980 – 2006, GAO projections from 2007 – 2050 using many CBO projections and assumptions, particularly for next 10 years.



# State and Local Fiscal Challenges Add to the Federal Government's Fiscal Challenge



Source: Historical data from National Income and Product Accounts, GAO Analysis

Note: Historical data from 2000 – 2006, projections from 2007 – 2050; state and local balance measure is similar to the federal unified budget measure. Federal Simulation Assumptions: Discretionary spending grows with GDP after 2007. AMT exemption amount is retained at the 2006 level through 2017 and expiring tax provisions are extended. After 2017, revenue as a share of GDP returns to its historical level of 18.3 percent of GDP plus expected revenues from deferred taxes, i.e. taxes on withdrawals from retirement accounts. Medicare spending is based on the Trustees' April 2007 projections adjusted for the Centers for Medicare and Medicaid Services' alternative assumption that physician payments are not reduced as specified under current law.

# Current Fiscal Policy Is Unsustainable

- **The “Status Quo” is Not an Option**

- We face large and growing structural deficits largely due to known demographic trends and rising health care costs.
- GAO’s simulations show that balancing the budget in 2040 could require actions as large as
  - Cutting total federal spending by 60 percent or
  - Raising federal taxes to 2 times today's level

- **Faster Economic Growth Can Help, but It Cannot Solve the Problem**

- Closing the current long-term fiscal gap based on reasonable assumptions would require real average annual economic growth in the double digit range every year for the next 75 years.
- During the 1990s, the economy grew at an average 3.2 percent per year.
- As a result, we cannot simply grow our way out of this problem. Tough choices will be required.

# The Way Forward: A Three-Pronged Approach

1. **Improve Financial Reporting, Public Education, and Performance Metrics**
2. **Strengthen Budget and Legislative Processes and Controls**
3. **Fundamentally Reexamine & Transform for the 21<sup>st</sup> Century (i.e., entitlement programs, other spending, and tax policy)**

*Solutions Require Active Involvement from both the Executive and Legislative Branches*



# Key National Indicators

- **WHAT:** A portfolio of economic, social, and environmental outcome-based measures that could be used to help assess the nation's and other governmental jurisdictions' position and progress
- **WHO:** Many countries and several states, regions, and localities have already undertaken related initiatives (e.g., Australia, New Zealand, Canada, United Kingdom, Oregon, Silicon Valley (California) and Boston)
- **WHY:** Development of such a portfolio of indicators could have a number of possible benefits, including
  - Serving as a framework for related strategic planning efforts
  - Enhancing performance and accountability reporting
  - Informing public policy decisions, including much needed baseline reviews of existing government policies, programs, functions, and activities
  - Facilitating public education and debate as well as an informed electorate
- **WAY FORWARD:** Consortium of key players housed by the National Academies domestically and related efforts by the OECD and others internationally

# Key National Indicators: Where the United States Ranks

The United States may be the only superpower, but compared to most other OECD countries on selected key economic, social, and environmental indicators, on average, the U.S. ranks

# 16 OUT OF 28

## OECD Categories for Key Indicators (2006 OECD Factbook)

• Population/Migration	• Energy	• Environment	• Quality of Life
• Macroeconomic Trends	• Labor Market	• Education	• Economic Globalization
• Prices	• Science & Tech.	• Public Finance	

Source: 2006 OECD Factbook.



# SERVING THE CONGRESS AND THE NATION GAO's STRATEGIC PLAN FRAMEWORK

## MISSION

GAO exists to support the Congress in meeting its constitutional responsibilities and to help improve the performance and ensure the accountability of the federal government for the benefit of the American people.

### THEMES

Changing  
Security Threats

Sustainability  
Concerns

Economic  
Growth &  
Competitiveness

Global  
Interdependency

Societal Change

Quality of Life

Science &  
Technology

### GOALS & OBJECTIVES

Provide Timely, Quality Service to the Congress and the Federal Government to . . .  
. . . Address Current and Emerging Challenges to the Well-being and Financial Security of the American People *related to* . . .

- Health care needs
- Lifelong learning
- Work benefits and protections
- Financial security

- Effective system of justice
- Viable communities
- Natural resources use and environmental protection
- Physical infrastructure

. . . Respond to Changing Security Threats and the Challenges of Global Interdependence *involving* . . .

- Homeland security
- Military capabilities and readiness

- Advancement of U.S. interests
- Global market forces

Help Transform the Federal Government's Role and How It Does Business to Meet 21st Century Challenges *by assessing* . . .

- Roles in achieving federal objectives
- Government transformation

- Key management challenges and program risks
- Fiscal position and financing of the government

Maximize the Value of GAO by Being a Model Federal Agency and a World-Class Professional Services Organization *in the areas of* . . .

- Client and customer satisfaction
- Strategic leadership
- Institutional knowledge and experience

- Process improvement
- Employer of choice

## CORE VALUES

Accountability

Integrity

Reliability

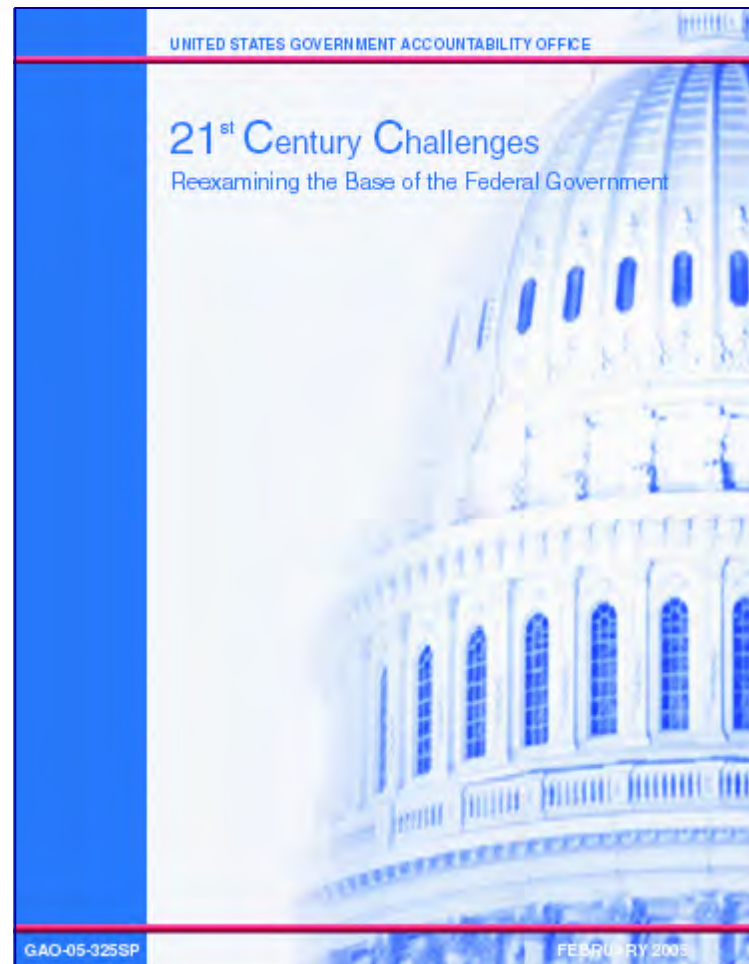


# Selected Sustainability Challenges

- Fiscal Deficits and Debt Burdens
- Health Care Quality, Access, and Costs
- Defense and Homeland Security Strategies
- Social Insurance Commitments
- Tax Gaps and Policies
- Energy, Environment, and Resource Protection
- Immigration Policies
- Infrastructure Needs

# 21<sup>st</sup> Century Challenges Report

- Provides background, framework, and questions to assist in reexamining the base
- Covers entitlements & other mandatory spending, discretionary spending, and tax policies and programs
- Based on GAO's work for the Congress
- Issued February 16, 2005



# Twelve Reexamination Areas

## MISSION AREAS

- Defense
- Education & Employment
- Financial Regulation & Housing
- Health Care
- Homeland Security
- International Affairs
- Natural Resources, Energy & Environment
- Retirement & Disability
- Science & Technology
- Transportation

## CROSSCUTTING AREAS

- Improving Governance
- Reexamining the Tax System



# Illustrative 21<sup>st</sup> Century Questions: Homeland Security

Homeland security & defense questions relate to:

- **Homeland Security Risk:** What is an acceptable level of risk to guide strategies and funding?
- **Critical Infrastructure:** Are existing incentives and initiatives sufficient to support private sector protection of critical infrastructure they own?
- **Information Sharing:** How can intelligence and information on threats be shared with other levels of government and other stakeholders?

# GAO's High- Risk List 2007

Addressing Challenges in Broad-based Transformations		Year Designated
• Strategic Human Capital Management <sup>a</sup>		2001
• Managing Federal Real Property <sup>a</sup>		2003
• <b>Protecting the Federal Government's Information Systems and the Nations' Critical Infrastructures</b>		<b>1997</b>
• <b>Implementing and Transforming the Department of Homeland Security</b>		<b>2003</b>
• <b>Establishing Appropriate and Effective Information-Sharing Mechanisms to Improve Homeland Security</b>		<b>2005</b>
• <b>DOD Approach to Business Transformation<sup>a</sup></b>		<b>2005</b>
• DOD Business Systems Modernization		1995
• DOD Personnel Security Clearance Program		2005
• DOD Support Infrastructure Management		1997
• DOD Financial Management		1995
• DOD Supply Chain Management		1990
• DOD Weapon Systems Acquisition		1990
• FAA Air Traffic Control Modernization		1995
• Financing the Nation's Transportation System <sup>a</sup> <b>(New)</b>		2007
• Ensuring the Effective Protection of Technologies Critical to U.S. National Security Interests <sup>a</sup> <b>(New)</b>		2007
• Transforming Federal Oversight of Food Safety <sup>a</sup> <b>(New)</b>		2007
<b>Managing Federal Contracting More Effectively</b>		
• DOD Contract Management		1992
• DOE Contract Management		1990
• NASA Contract Management		1990
• <b>Management of Interagency Contracting</b>		<b>2005</b>
<b>Assessing the Efficiency and Effectiveness of Tax Law Administration</b>		
• Enforcement of Tax Laws <sup>a</sup>		1990
• IRS Business Systems Modernization		1995
<b>Modernizing and Safeguarding Insurance and Benefit Programs</b>		
• Modernizing Federal Disability Programs <sup>a</sup>		2003
• Pension Benefit Guaranty Corporation Single-Employer Pension Insurance Program		2003
• Medicare Program <sup>a</sup>		1990
• Medicaid Program <sup>a</sup>		2003
• National Flood Insurance Program <sup>a</sup>		2006

# Definition of Waste

Waste involves the taxpayers as a whole not receiving reasonable value for money in connection with any government funded activities due to an inappropriate act or omission by players with control over or access to government resources (e.g., executive, judicial, or legislative branch employees, contractors, grantees, or other recipients)

Importantly, waste represents a transgression that is less than fraud and abuse and most waste does not involve a violation of law. Rather, waste relates primarily to mismanagement, inappropriate actions, or inadequate oversight



# Examples of Waste

Illustrative examples of underlying causes of waste in the acquisitions and contracting area could include:

- Unreasonable, unrealistic, inadequate, or frequently changing requirements
- Failure to use competitive bidding in appropriate circumstances
- Failure to engage in selected pre-contracting activities for contingent events (e.g., hurricanes, military conflicts)
- Congressional directions (e.g., earmarks), and agency spending actions where the action would not otherwise be taken based on an objective value and risk assessment and considering available resources

# Systemic Acquisition Challenges

1. Service budgets are allocated largely according to top line historical percentages rather than comprehensive strategic assessments and current and likely resource limitations
2. Capabilities and requirements are based primarily on individual service wants versus collective national needs (i.e. based on current and expected future threats) that are both affordable and sustainable over time
3. Defense consistently over-promises and under-delivers in connection with major weapons, information, and other systems (i.e. capabilities, costs, quantities, schedule)
4. Defense often employs a “plug and pray approach” when costs escalate (i.e. divide total funding dollars by cost per copy, plug the number that can be purchased, then pray that Congress will provide more funding to buy more quantities)
5. Congress sometimes forces the department to buy items (e.g. weapons systems) and provide services (e.g. additional health care for non-actives) that the department does not want and we cannot afford

# Systemic Acquisition Challenges (cont'd)

6. DOD tries to develop high risk technologies after programs start instead of setting up funding, organizations, and processes to conduct high risk technology development activities in low cost environments (i.e. technology development is not separated from product development). Program decisions to move into design and production are made without adequate standards or knowledge
7. Program requirements are often set at unrealistic levels, then changed frequently as recognition sets in that they cannot be achieved. As a result, too much time passes, threats may change, and/or members of the user and acquisition communities may simply change their mind. The resulting program instability causes cost escalation, schedule delays, fewer quantities and reduced contractor accountability
8. Contracts, especially service contracts, often do not have definitive or realistic requirements at the outset in order to control costs and facilitate accountability
9. Contracts typically do not accurately reflect the complexity of projects nor appropriately allocate risk between the contractors and the taxpayers (e.g. cost plus, cancellation charges)



# Systemic Acquisition Challenges (cont'd)

10. Key program staff rotate too frequently thus promoting myopia and reducing accountability (i.e. tours based on time versus key milestones). Additionally, the revolving door between industry and the Department presents potential conflicts of interest
11. The acquisition workforce faces serious challenges (e.g. size, skills, knowledge, succession planning)
12. Incentive and award fees are often paid based on contractor attitudes and efforts versus positive results (i.e. cost, quality, schedule)
13. Inadequate oversight is being conducted by both the Defense Department and the Congress which results in little to no accountability for recurring and systemic problems
14. Some individual program and funding decisions made within the Department and by the Congress serve to undercut sound policies
15. Lack of a professional, term-based CMO at DOD serves to slow progress on defense transformation and reduce the chance of success in the acquisitions/contracting and other key business areas

# Challenges Faced by the Coast Guard

- Increasing demands upon all resources to conduct more maritime security missions.
- Need to continue legacy missions such a fisheries protection, law enforcement, search and rescue, marine safety, and polar ice breaking.
- Need to maintain aging fleet of ships and aircraft while at the same time move forward with plans to replace them through Deepwater acquisition program.



# Coast Guard Deepwater Acquisition Challenges

- Coast Guard's Deepwater modernization program experienced problems in:
  - program management, including ineffective management and oversight teams, inadequate staffing, and ill-defined roles and responsibilities
  - contractor accountability and linking contractor performance to awards; and
  - control of costs through competition





# Coast Guard Deepwater Acquisition Actions (cont'd)

- Coast Guard has announced and begun to implement actions to address these challenges, including:
  - taking over leadership of program management from the contractor
  - hiring acquisition staff and developing human capital improvements
  - revising award criteria to include incentives for performance; and
  - conducting business case analyses to ensure competition for future asset acquisitions



# DHS Acquisition Management Challenges

DHS has struggled to provide adequate support and oversight of its acquisition function. It remains important that it:

- integrate the acquisition functions of component organizations more effectively across the department
- develop clear and transparent acquisitions policies and procedures, along with an acquisitions workforce trained to implement and monitor them; and
- evaluate and work to mitigate risks associated with contracts for services that support inherently governmental functions

# DHS Progress Report: Acquisition Management

- DHS reported acquiring \$15.6 billion in goods and services in FY 2006,
- DHS has made modest progress in achieving the following acquisition management performance expectations
  - Organizing acquisition functions to meet agency needs.
  - Developing clear and transparent policies and processes.
  - Developing an acquisition workforce to implement and monitor acquisitions.
- Improved assessment and oversight needed to manage risks of contractors performing tasks closely supporting governmental functions.



# **Trans** ***FORMATION***

## **Webster's definition**

**An act, process, or instance  
of change in structure  
appearance, or character**

**A conversion, revolution,  
makeover, alteration, or  
renovation**

# Four Key Transformation Dimensions

Key Actions	Primary Responsibility	Secondary Responsibility
1. To make prudent budget & long-term fiscal decisions	The President and the Congress	Agency leadership (both political and career)
2. To enable key transformation efforts while providing protection from abuse of authority	The Congress and the President	Agency leadership (both political and career)
3. To lead key transformation efforts with existing authorities and within existing resource levels	Agency leadership (both political and career)	OMB and other selected government-wide agencies
4. To evaluate reform efforts and conduct continuous improvement initiatives	Agency leadership (both political and career)	Congress, OMB and selected government-wide agencies

# Effective Management of Services Requires Both Strategic and Transactional Efforts

## Strategic Level

Effective service acquisition requires the leadership, processes, and information necessary for mitigating risks, leveraging buying power, and managing outcomes

## Transactional Level

Individual service transactions must focus on buying the right thing, the right way, while getting the desired outcomes

A comprehensive approach would use the strategic and transactional factors in a complementary manner to tailor management activity to ensure preferred outcomes

Source: GAO (analysis).



# The Objective of Transformation for the Coast Guard

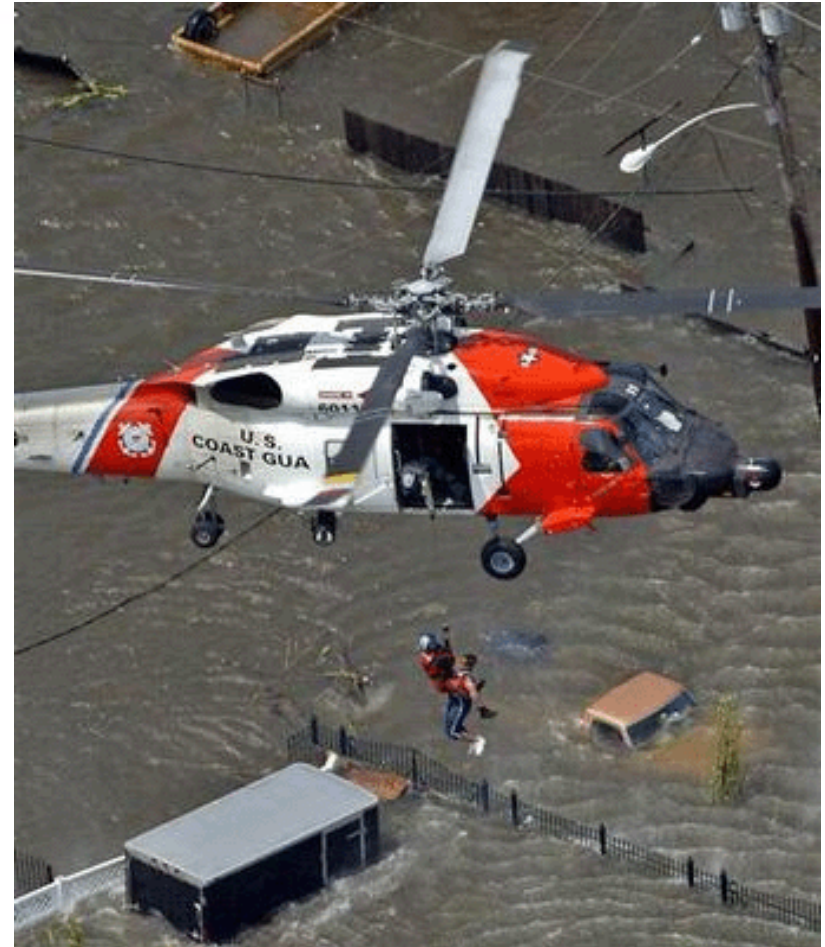
From the Commandant:

- Making the force structure more responsive to mission execution.
- Making support system more responsive to the operators.
- Making Coast Guard more responsive to the nation.



# Commandant Directed Coast Guard Next Steps

- Take immediate steps to reorganize operational forces
- Improve service and support systems
- Better align with departmental and interagency partners
- Make logistics and financial systems more efficient and accountable



# Three Key Illnesses

- ***Myopia***
- ***Tunnel Vision***
- ***Self-Centeredness***



# Four National Deficits

- ***Budget***
- ***Balance of Payments***
- ***Savings***
- ***Leadership***

# Five Leadership Attributes Needed for These Challenging and Changing Times

- ***Courage***
- ***Integrity***
- ***Creativity***
- ***Stewardship***
- ***Partnership***



UNITED STATES GOVERNMENT ACCOUNTABILITY OFFICE

# 21st Century Transformation Challenges and Opportunities

**The Honorable David M. Walker**  
**Comptroller General of the United States**

**The Coast Guard Innovation Expo**  
**New Orleans, LA**  
**October 30, 2007**



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## On the Web

Web site: [www.gao.gov/cghome.htm](http://www.gao.gov/cghome.htm)

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